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BIRD NOTES

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by

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PART IV

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Subject: mainly Thrashers, Road-runners

with six pages of illustrations

feet as if watching him.

1935

Jan. 1st.

Brownie sang a great deal until about 8:30 A.M., at which time he left the oval lawn where he had been singing (Nova being with him) and went off toward the south west apparently to establish contact with another thrasher which had been singing almost continuously there. A few minutes after his departure the two birds could be heard at the same time in the distance.

2 P.M. Rhody has just finished swallowing an English sparrow that I shot for him, so that he might start the New Year with a full stomach. This bird must have been an unusually large one, as Rhody, after spending 15 or 20 minutes in picking off perhaps half of the feathers, succeeded in getting him down only after a series of titanic efforts during which he had to rest frequently and replace the bird on the ground again to regain strength for another effort. Loose feathers stuck to his bill, and when he could not shake them off, he either pushed them off with his foot or wiped his bill on the ground. In the latter operation leaves and litter of various kinds were often added to the collection on his bill, making the situation still worse. When he failed to swallow the bird at one place he would move to another two or three feet away, rest and try again. After about ten or 15 minutes of this, by a last mighty effort he got the bird by the critical point and the rest was just plain swallowing. Once or twice I was quite certain that he had, at last, overestimated his own capabilities.

Hawks killed a robin and wounded (or killed) a quail here today. One of them flew about 5 feet in front of my face. All birds shy.

Jan. 2nd.

B's song not heard until after sunrise.

Rhody, about 10 A.M. was waiting for me at the fence. When I showed him a piece of meat,

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holding it about 4 feet from him, he opened his bill wide and made a faint, high-pitched mewing sound, very much like the cry of a very young kitten. Description of this sound has eluded me heretofore. He seldom makes it. When he took the meat he said: "Ooh!", then spread his feathers to warm his back in the sun, facing away from me. Although he was only about three feet from my feet, when I turned and walked away he did not turn his head to see what I was doing and showed no signs of uneasiness. This is characteristic of him and directly contrary to Brownie's behavior under similar conditions; yet, in most respects, Brownie is by far the tamer bird.

Jan. 3rd.

B's song first heard after sunrise. He was in his nest for the night at "4:30 P.M. although it was bright and clear and the sun was not due to set for another half hour.

Rhody is not coming to the cage for meat so often now. At present he is almost sure to be found, when he is not stowed away for the night, in the lot to the west during daylight hours. This lot has the combination of covert and open which he seems to prefer, together with wide outlook. It is a continuation of the spur on which this house stands and there is always some place on it which is sheltered from wind, irrespective of the direction from which it blows.

Jan. 4th.

Heavy rain during the night and frequently during the forenoon.

B's early song as usual.

Rhody, at 10 o'clock, was found sitting above the sidewalk at the top of the high bank which bounds the "west lot" along its western side. He looked dry and comfortable, but as soon as he saw me coming around the corner he greeted me with his mewing sound--uttered once, long drawn out and, this time, quavering. He came for meat with little hesitation.

While he was catching worms tossed to him, Mike, the gardener of the tract, approached carrying tools on his shoulder, and watched. Rhody became a little uneasy, but did not run away. He evidently knows Mike, which is to be expected, as he has seen him many times about the parking. Mike, an Italian, says that Rhody "got it a brain."

Jan. 5th to 8th., inclusive.

During this period early song by Brownie has been heard every morning. The tendency has been for him to wait until after sunrise, instead of beginning earlier as formerly noted. He has stayed home most of the time, sung occasionally at intervals during the day--full song. Sub-song very often and of long duration.

During the last day or two there seems to have been an increasing disposition on his part to carry the "last" worm to Nova as if he were mindful of the approaching mating season.

He continues to occupy his nest at night, and occasionally during the day for short periods.

At times a third thrasher was seen with Brownie and Nova during this period. B seems to have been only mildly concerned about it and Nova has skirmished slightly with it once or twice.

Nova, though present much of the time, usually keeps her distance and is not seen in B's immediate presence so persistently as was Greenie at the same season.

This has been a time of frequent rains and the precipitation to date is above normal.

Rhody continues true to form with occasional clownish evolutions about the shrubbery and insulting posturing for the benefit of the magpies on top of their cage. He seems to have lost his meek attitude toward them entirely as long as he is outside the cage, and seems to have replaced it by a feeling of superiority.

Jan. 9th. to 11th., incl.

During this period Brownie has not omitted his morning song once. He seems to remain on the place and has no difficulty in getting Nova to appear when he chooses. He indulges in occasional short outbursts of song at various times during the day and occupies his nest regularly at night.

Rhody maintains his regular habits also.

Jan. 12th.

B opened the day as usual.

About 10:A.M., when he wanted Nova to show up, he went up the old oak and called and she quickly joined him there.

He has revealed a new phase in his talk when flying up to my hand for the first time in the morning.

Thus, on the ninth, he sounded like a robin.

On the tenth, he was an English sparrow.

On the 11th., he used a phrase repeatedly which he has caught from the magpies, sounding like witch'-chaw. ()

He followed this by scripping loudly while still on my hand. I listened to each scrip intently, but it eludes accurate description.

At 10:30 A.M. Brownie retired to his nest for an indefinite sojourn.

Jan. 15th. to 17th., incl.

This has been a time of frequent rain, bringing the precipitation well above normal. This has not interfered with B's singing at all, in fact, he is heard more frequently now during the day.

Rhody seems to keep dry, although he has almost no protection from the rain in his roost. He spends a lot of time warming his back, spreading his wings and coverts to let the sun get at his under "fur".

As these notes reveal, thrashers and the road-runner select different portions of their respective anatomies for intensive sun treatment. The reason for this is not clear.

Rhody's dusting is not a prolonged action like that of other dusting birds, such as quail, for example. He does not work the dust up among his feathers. His object appears to be to scratch his throat, breast and belly. Any place will serve, whether there is loose earth there ^{or} ~~are~~ not. For example: the hard ground or even a concrete side-walk. The operation lasts but a few seconds.

About 3:30 P.M. on the 17th. I came upon Rhody in the orchard and stopped about 15 feet from him. Brownie put in an appearance about 25 feet away in the bushes and almost in line with Rhody. I wanted to see how they would behave toward each other, so displayed worms. R did not apparently see B, but the latter was acutely aware of the former's presence and somewhat suspicious. Rhody came to me first and I tossed worms to him at about 3 feet distance, he catching them on the fly expertly. B approached warily and when R saw him, B craned his neck and watched him interestedly. B made a detour about R and approached me from the side somewhat nervously. I then gave them worms alternately, B taking them from hand and retreating each time. Finally he would only approach me from the rear, R being in front of me stretching his neck to watch B. He seemed to be actuated by curiosity only and made no hostile moves. I tossed a worm into neutral territory, which Rhody ran for and got, B making no effort to get there first.

Voices of children were suddenly heard in the distance. R immediately lost all interest in me and stared intently through the fence, did not like what he saw (two children about 200 yards away, not even approaching us), ran swiftly past me, climbed the bank behind me, went up into a ceanothus where he could get a good view and watched the children as long as they were in sight (perhaps

15 minutes) then composed himself for a good rest. I do not know whether he was afraid of the children, curious about them, or just decided that he had had enough worms. (He had just visited the cage a few minutes before, for meat and had completed there a series of ridiculous antics for the benefit of the magpies, dodging about the cage, posturing and booing with rattling beak).

Brownie went up into a tree about 25 feet from Rhody and rather unexpectedly sang full song for several minutes, in short bursts. R did not even look in his direction. I went away and left them without making further observations.

During this 5 day period Nova was observed to be present often, and a sharp-shinned hawk was shot in the old oak.

At this time last year both Brownie and Greenie were carrying twigs to various prospective nesting sites and showing strong, though uncoordinated nesting symptoms. There has been none of that this year. In this connection may be considered as having possible bearing upon the matter:

More rain this year,
Nova as a mate instead of Greenie,
A nest already built in which no eggs have
been laid, but which is occupied by the male
every night and at times during the day.

Jan. 19th. to 20th., incl.

The minimum thermometer here showed the lowest temperature of the winter so far on the morning of the 19th., viz.: 32. The official Weather Bureau minima were: San Francisco, 79; Oakland 72.

The birds seen here on the 19th. (no special attempt being made a complete at an XXXXXXXX census) were:

Varied thrush,	Ruby crowned kinglet,	Flicker,
Western Robin,	Bush tit,	Golden crowned sparrow,
Cal. Jay,	Wren tit,	Nuttall (and/or)
Purple finch,	Plain titmouse,	Gambel sparrow
Cal. linnet,	Vigors Bewick wren,	Junco,
Hermit thrush,	Spotted towhee,	Cal. thrasher,
Anna hummer,	Cal. Brown towhee,	Road-runner
Cedar waxwing,	Fox sparrow,	Song sparrow
Quail,	(No English sparrows, and, curiously, no larks).	

Brownie's full song is being heard now more often and for longer periods at a time and ^{until} later in the day. He is using three-quarter also more frequently. His sub-song, as usual, may be heard at almost any time and may be without a break, also as usual, for many minutes at a time. On the 19th., much to the surprise of a visitor (R) who had never even heard of thrashers, he came out of the bushes, stood within arm's reach of us where we crouched on the lawn, faced us and sang a continuous sub-song as long as we cared to listen, interrupted only ^e whenever I handed him a worm. As illustrative of the elusory character of the song: The visitor wished to be assured that it really was he that was doing the singing and was told to watch the bird's throat which was plainly pulsating, although the bill was not being opened and closed. My visitor said that he "would not have believed it".

Rhody continues on the job.

Jan. 21st.

Brownie continued to sing as usual, beginning after sunrise with short bursts of full song at intervals during the day. Nova still here, but as shy as ever.

Rhody figured prominently in the day's happenings, being unusually tame and confiding. In the morning when I called in the direction of his supposed location, he promptly appeared, ran to me from a hundred or so feet away. When he took the meat from hand he did not run off with it a few feet as is his custom, but stayed with me, following up with worms. He visited the cage and loafed about the oval lawn and the pool for a long time watching the fish. (See p. 873A) and sunning his back. Later when he saw me standing on the bank of the entrance road, he ran over to join me without being urged and stood at my feet looking off over the country. I saw a stranger approaching from the street and watched R's reaction. He was in a less favorable position than I on account of intervening bushes,



Sunning



Drinking



Walking

so did not see the man until he was about 30 feet away. Apparently neither had he heard him. It was therefore a surprise to Rhody when the man (a stranger to me also) suddenly appeared out from behind the bushes. I had expected R to bolt, but instead, he immediately crouched down flat on the ground and kept his place, watching carefully however. The man stopped when he saw the bird and I invited him to "come ahead", telling him that I wanted to see what would happen. I talked to Rhody reassuringly and he relaxed, permitting the stranger to approach to the foot of the bank as close as it was possible to get. Even then he did not go away for perhaps a minute or so, then wandered off slowly as if no longer concerned with our affairs, in possession of all his faculties and with honor. This was quite a severe test for him. A half hour afterward he was sitting quietly in the outer compartment of the cage where I gave him another piece of meat as a reward. I had replaced the mirror there this morning. He pecked it a few times mildly, but he seems to be altogether too sophisticated now to expect anything come of his efforts. The mirror had not been in place for about 2 weeks. If he had forgotten about it ^{in the meantime} one would have expected him to go frantic over it on seeing it again as he did at first. It would seem to me, therefore, that he has shown ^{not only} a certain amount of ability to learn from experience--an experience that, moreover none of his ancestors ever had in all probability--but the ^a capability of retaining in his mind over a considerable period of time ~~sufficient~~ recollection of the futility of his past ~~experience~~ ^{endeavors} sufficient to guide his actions at some future time when again confronted with the same problem.

Jan. 22nd.

A lot of full song by Brownie up to now (10:30 A.M.).

About 10 I called Rhody at the accustomed place, but he did not appear. I was about to go across the street and see if he was

still in bed when I saw him running rapidly through the bushes on the south bank toward the side gate. When he reached the gate he came through, doubled back to me and reached for the proffered meat, saying: "Ook, ook, ook-ook, ook", very softly. (oo as in look). As noted yesterday, he did not retreat with it, and although he wanted no more food at the moment, he remained with me a few minutes, walking away slowly when Brownie came for worms saying: "Pe'-low" almost over and over again. I have ~~never~~ seen Brownie at this place before. From his talk and the unusual locality I suspected Nova's presence and so it developed. B again showed his increasing tendency to take more than ^{one} worm at a time from the box and retreat into the bushes toward his mate, though not feeding her. This I take as a symptom, perhaps, of increasing mating desire. Incidentally the plain titmice are showing renewed interest in their house. This will be the 9th.(?) year that they have reared a brood in it.

11:40 A.M. About 11:20 Brownie discovered me in the orchard and worked toward me gradually pretending to be digging industriously but really, I think, making only a bluff, as it was apparent that he did not deviate in the slightest from the shortest route to me. Naturally he flew up for worms. He then went up into a ceanothus, sat about 15 feet away facing me and for 15 minutes sang a most beautiful and varied three-quarter song. There was not one harsh note in it. It was built about his "A" song (bugle song) as a central theme, but he introduced innumerable variations on it that were entirely new and which I am not musician enough to be able to record. This song usually has no "words" fitted to it, though often the two opening notes sound like: pur-ple. On this occasion there were no words and, to my ear, the song most nearly resembled the music of a flute. Of all of his songs this one is the one that most nearly approximates conventional human music. Most persons hearing phrases of it for the first time do not think that it is

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made by a bird. It can be very closely approximated^{by} a skilful whistler with a good ear provided he is able to get the requisite mellowness of tone. In fact, at a distance of say 100 feet the ordinary ear cannot^{with certainty} distinguish between bird and man if the performances are limited to one of the simple types without variations.

In the song of a few minutes ago Brownie "called the dog" by whistling followed by the kissing sound; introduced the ka-dah-kut. of the hen and other imitations. When Nova joined him they greeted each other harshly, B quit singing and came down directly to me as if knowing that reward was in order. It is curious that such melodious singers should reserve their harsh expressions for their husbands and wives.

Rhody went to bed before 3:30 P.M. I was looking for him in order to give him a sparrow that I had just shot and hunted everywhere about the place expecting to find him near where I had just been giving him worms a minute or two before. However he had not waited.

Jan. 23rd.

Brownie's singing continued as usual.

Rhody was offered the sparrow several times today, but was not even tempted by it. When shown meat he immediately brightened and came for it. He is beginning to invite himself to be present when he sees me feeding Brownie. This makes B shy.

Jan. 24th.

Singing as usual.

I often find Rhody and Brownie in the same clump of bushes, (or perhaps they both see me before I locate them and, having the same objective, foregather thus accidentally).

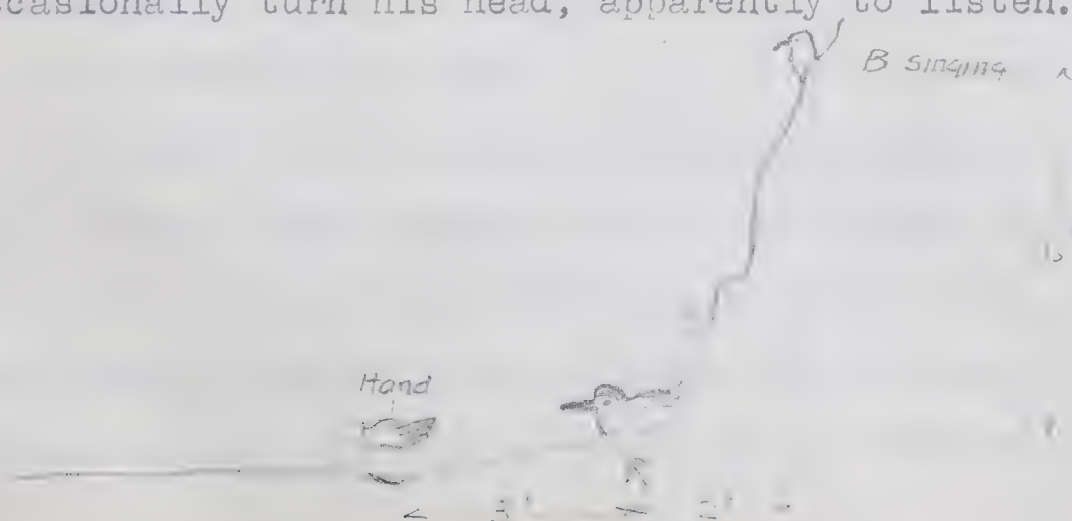
About 9:30 A.M. Brownie came up out of the chaparral for worms. I noticed that he was rather stiff and restrained. Looking behind I saw Rhody just coming out of the bushes behind me about

6 feet away. B would not come nearer than 10 feet, while Rhody seemed to consider that the show was all for his benefit. As a consequence I had to toss worms to B while R took them from me direct. This is verging on a reversal of the expected.

Both of them went down into the "chaparral" on the south bank by different routes and when I looked for them again, were only about 10 feet or so apart. Rhody spent quite a bit of time in the upper portion of the bushes and seemed to be looking for something. I induced B to come back over the fence to get worms that Rhody had cheated him out of and gave him a good feed. I watched them both for more than an hour and got the impression that Rhody has a special interest in B and wishes to keep track of his movements in the bushes hoping to locate a nest. I have had this feeling ever since R was at B's nest in the dormitory tree, as noted herein.

Neither of them left the chaparral for more than an hour, though each came for worms ^{two} to or three times where I stood outside the fence on the sidewalk. Rhody came without special urging, whereas B was shy and careful. His nearest approach to Rhody was about 2 feet. At that time the luxurious road-runner was lying down facing me three feet from me waiting for me to toss worms into his mouth. He has learned that I am a good enough shot so that he can catch most of the worms lying down!

Just before B made this close approach he had been sitting on the bank just above Rhody singing continuous undersong. R would occasionally turn his head, apparently to listen.



Jan. 25th. to 28th. incl.

During this period Brownie's full song has increased in frequency, beginning about sunrise and being heard at fairly frequent intervals up to about 3 P.M. Its character is somewhat fragmentary and imperative with a tendency toward harsh phrases. Nova is frequently seen with him in the same tree when he is singing, so the object of his song can not be entirely to call her. Other thrasher songs are being heard more often in the distance and B seems to be giving his attention to them. At present one singing post seems to be about 300 yards, or perhaps more, to the south west, and another about the same distance to the south east; in "Sampson" and "Reynolds" territory respectively. B seems to be announcing his territory for the benefit of other thrashers and, presumably, the others are doing the same thing. He is using sub-song less and three-quarter song more. There has been no carrying of nesting material, but B occupies his nest every night. I am inclined to think that Nova roosts away from here and that B has to find her every morning.

Speculation as to the reason for Rhody's declining interest in the mirror has been somewhat upset by a renewed interest on his part at times quite enthusiastic, although I think he has lost some of his illusions regarding it. On the edge of the sidewalk, in the chaparral is a small black acacia about 15 feet high. Lately R has been roosting in this tree fairly often in the day time.

Jan. 29th.

B performing as usual.

At about 9 A.M. it occurred to me to see if R was in the acacia noted above. Sure enough, he was and greeted me with his whine on seeing me. When I talked to him he would whine, but he would not come down for meat, though plainly considering the matter. Several times I walked off about 50 feet and each time I returned he would

greet me with this same high-pitched, soft sound. Altogether he whined at me eight times, which is a conversational record for him. I left him there to decide upon his future movements without suggestions from me.

At 10:30 he entered the cage for meat and another go at the mirror. This time he quite definitely tried to catch the "bird" behind it several times. However, he was not so absorbed in this pastime as to prevent his coming to me to catch worms tossed to him, returning again to the mirror, then to a tour of inspection of the birds inside the inner compartments of the cage. It is curious to observe that, while he can approach the mirror calmly enough and even regard his reflection in it without excitement at times, still when he has apparently made up his mind that he is going to have no more foolishness about it, break the spell and ignore it and walk placidly past it, he will, notwithstanding this resolution, put on extra speed as he goes by, stopping suddenly a foot or two beyond, as if forgetting all about it. Or
It is as if he suspected that some sort of a demon lurked behind the glass ready to reach out and grab him as he goes by, but that is powerless to act as long as the intended victim is off to one side.

There is no doubt of his interest in the captive birds. He seldom fails to show them some attention. Usually, as on this occasion, he goes up on top^{of the cage}, follows them about on the other side of the wire, thrusts his bill through at them, scrapes it on the wire as if to stir them up and is all animation and keen interest. The mocking-bird is frightened by this, but the rail and the magpies take it all more or less phlegmatically, though responding somewhat. He does not usually raise his crest when engaged in this sport, but he does display the skin colors back of his eyes to full advantage, the white and the red (orange red?) being especially pure and brilliant.

Jan. 30th.

During the day nothing was observed out of the usual run of events in connection with the thrashers and the road-runner.

Jan. 31st.

Unusual absence of song. 12:55 P.M. It was noted that only one full song was heard about

sunrise, and as the morning proceeded, an unusual silence on the part of Brownie prevailed. It occurred to me that this might indicate active nesting, notwithstanding the fact, that contrary to experience of last winter, there has been no carrying of twigs up into trees during the ^{present} winter months, although Brownie has continued to sleep in his September-October nest in the dormitory tree every night and has sat in it frequently during the day time. As no eggs have ever been laid in this nest, it was thought that it might be used for the first brood of this year, consequently it has been rather closely watched.

Investigation. As the silence continued, I went out to look for B about 10 A.M. found.

to see what it might portend. He was found sitting in the top of a baccharis bush outside the fence to the west; not a usual place for him. He was ¹taking in very low tones, presumably to his mate out of sight near by, and strangely enough, would not come to me

Ditto Rhody. for worms, so I left him and looked up Rhody who proved to be only a few feet away in a tree. Rhody would not come to me either, so I went to him and handed him a piece of meat which he accepted readily. Brownie had, in the meantime, gone to the eastern end of my place about 150 yards away and into the chaparral on the bank.

There he was found with Nova inspecting nesting sites together. As I watched he began to carry twigs up into an acacia armata, apparently placing them definitely. Nova joined him there.

Rhody's first song of season. At exactly 10:45 Rhody's cooing song was heard (for the first time in several months) from the same general vicinity. I went down to the street to investigate. Rhody was six feet up in a tree about

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atches B. 15 feet from the presumptive nest location, staring in that direction B came down, came to me for a worm, then began looking for twigs on the ground directly under Rhody! I wonder what he knows about R's food habits.

A passing milk truck caused the birds to disperse for a time, but B was back again at the nesting location working and R was prowling around somewhere near rattling his beak softly. He has not done this either for a long time. Clearly things are beginning to stir, although it is nearly two months before winter (astronomically) ends.

Precisely with the blowing of the twelve o'clock whistles B burst into full song from the "nest" and Nova ran to him from about a hundred feet distance^t. R was sunning himself innocently on a bank in the orchard, perhaps already tasting thrasher eggs (or chicks) in anticipation.

till works. 1:45 P.M. Brownie is working hard in the kangaroo thorn, tearing off shade-killed twigs for his nest. Nova not seen. The growth is too dense to see inside clearly and one risks being skinned alive if he tries to penetrate it.

3:08 P.M. Went and sat inside the fence, outside the glade, near the fence. B not in sight, but he soon came to me for worms, from the direction of the nest. He shows already a certain amount of anxiety about it. When a jay screamed he jumped down from my knee and ran toward the nest, looked all around and returned. After finishing the worms, he began gathering twigs and carrying ^{them} to the same spot. No further observations until:

5:15. Neither R nor B in his accustomed sleeping place. This is understandable for B, not for R.

5:30 (Sunset 5:30). Rhody still not at home. B singing full song in the glade. New for this season. *and how*

5:45. Neither at usual roost.

5:50 B is in his nest in the dorm. What has come over Rhody? Has he shifted nearer to nest 10? so as not to miss the first egg?

8:45 P.M. The scamp is definitely not in his regular roost.

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February 1st.

There was early morning song of short duration.

At 8:15 A.M. Brownie came out of the chaparral from near the nest location, sat on my knee to eat worms, then picked up a twig and carried it through the fence. I could catch glimpses of him through the dense foliage, placing it .

A visit to Rhody's tree failed to disclose him.

At 9:20 the performance of Brownie was repeated. A search for Rhody proved fruitless. He was not to be found in any of his accustomed haunts.

About 10:20 while Brownie was drying himself after a bath, I went down to the sidewalk to see if the nest was visible from the south side. I saw something that looked like it and marked an arrow on the walk pointing to it. When B had dried himself he was given food and returned to work. (This has always been a typical reaction). I went to the south side and Nova flew out of the marked location, followed by B. When B returned to work it was seen that the object previously located is the nest.

11:35. B is working at intervals at the nest, Nova frequently in the vicinity, but not seen actually working. B occasionally summons her with song when she is absent and she obeys.

Neither sight nor sound of Rhody. The coincidence of his first spring song with his disappearance from his accustomed night roost, followed by his absence this morning suggests that he may have spring fever and be looking for a mate.

Again the fact of his breaking into song while watching B start his nest, suggests that this operation may have conveyed ^a ~~some~~ suggestion to him reflecting on his own bachelorhood.

During the rest of the day Brownie was at work whenever I visited the nest.

Rhody was not seen and did not use his regular roost. ^{at night}

Feb. 2nd.

Thrasher song was heard about an hour before sunrise and ceased after a half hour or so, presumably when B went to work on the nest.

At 8:30 B was working hard and would not come for food offered. Nova was also present and may have been working.

About 9:30 B still working, Nova also at the nest, though not seen actually working. B paid no attention to my calls at first; but when I stood outside on the sidewalk, he flew directly from the nest to my hand, eating from the box in the other hand. He then returned to work actively, placing a twig about every one or two minutes. Nova ^{had} ~~ran~~ off when she saw me approaching. This is evidently a serious effort, without preliminary uncoordinated twig carrying, and seems to bear the stamp of Nova's approval.

Rhody is still unaccounted for and has not visited the cage for meat. (10:20 A.M.).

Brownie worked actively during the rest of the forenoon.

At 2 P.M. while two of us were sitting at the cage watching the birds, Rhody appeared suddenly and silently, entered the cage, got his meat and went off with it. This is an absence of about 48 hours. A few minutes afterwards I found him in the orchard. When he heard children's voices he was immediately alarmed, went up into a shrub and watched the children as long as they were in sight. He would not take worms held directly under his bill, and offered no objection when I took ^{hold of} the tip of his tail. Possibly he was unaware of the act.

B continued work at the nest until nearly 5:30, then retired to his regular sleeping place. He has made good progress.

I was delighted to find Rhody also in his regular place after two nights' absence. I do not want him to go, although his presence may bode ill to the prospective thrasher broods, and I do not

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want to cage him because he is happier when free and I also wish to see whether he will be able to find a mate. I am thus between the horns of a dilemma.

Feb. 3rd.

The sun rose in partial eclipse, but obscured by clouds. This made no difference to B who sang as usual and was found working diligently at the nest. When he had eaten food from hand he proceeded to call Nova in loud, musical phrases while still a foot or two from my hand, using phrases such as: torcuíta, berna-chaé-cua, pe-e'-low, etc. connected by soft warbling runs, grace notes, trills, etc. not generally heard at greater distances. When this did not bring his mate he climbed up into a Fremontia and let himself go, introducing the russet-backed thrush song. This had the desired effect.

He has made such progress on the nest that he is now searching for soap root ribbons to be used as a preliminary to lining with the fibre of which these ribbons are composed. I gathered a supply of this material for him and he is using it.

I looked for Rhody at all the usual places and when I had abandoned the search, happened to look behind me, and there he was trotting after me; so in this case, he found me instead of the reverse. He took the proffered meat from me with a satisfied(?) ook. A piece of Hamburger steak 3 or 4 inches long in a roll $\frac{3}{4}$ to 1 inch in diameter, swallowed whole, satisfies him for the time being. He does not seem to be a big eater.

No observations made after 1 P.M. other than to note that it rained much ^{of} the afternoon.

Feb. 4th.

Rain threatening. Early song heard. B working at the nest all the morning. Hawk raids.

Rhody, in his roost at 10 A.M. refused to come down to get meat,

but greeted me with a whine and "smacked his lips" and swallowed. I have noticed before that the offer of food often causes him to do this even though he does not come and get it.

About 10:30 I called to him from the top of the bank across the street on my own place. Two men were at the Scamell front door about 25 feet from him looking at him in the tree. He came down, walked unconcernedly across the lawn in front of them, out into the street and inspected their delivery car, then across the street, climbed the bank, then the tree behind which I stood and looked at me through the fence, as if intimating that the next move was mine. When the men drove off, he reached through the fence promptly for the meat, as if he had been unwilling to show off in their presence.

-out

His actions through gave the impression that he wanted us to understand that my calling had nothing to do with his decision to get up (or come down). He was going to look at the car anyway, and naturally, as a matter of routine, thereafter he would cross the street in any case and if it chanced that I happened to be in line with his predetermined route, there was nothing in that to get excited about.

Feb. 5th.

(Owing to absence, observations were not made yesterday afternoon)

There was a lot of singing this morning up to about 11 o'clock. Part of the time a third thrasher was here and there was a confusion of sounds as they moved about from place to place, although there did not appear to be any actual pursuit. A fourth thrasher was singing loudly (at O'Neill's 260 yds. due S.?). Owing to all of this excitement, little attention was given to the nest, but when it had quieted down, B, on the path near me, called Nova with a series of single, whistled notes followed by a kissing sound, and began picking up fibre of soap root (not ribbons). Nova, who was digging about 20 yards away, ran to him at once, although it

involved coming to within 20 feet of me, and also began gathering fibre. Both went to the nest and at 12:15 when I left were both actively engaged. So Nova appears definitely committed to the enterprise. Notes in connection with earlier nests will show that the females are often inclined to work little (sometimes not at all) on the nest until the lining stage is reached, at which point they may work actively.

About 11:30 Rhody, who had just finished a long rest on the ground after having eaten his meat inside the cage, went down into the chaparral not far from the nest. However, he was not seen to show any interest in it, and at 12:30 was roosting quietly in an acacia 25 feet from it. So as not to disturb Nova, I was watching all this from the other side of the street, but B spied me from the nest itself and ran all the way over to me for ^{only} 3 worms then returned to work.

Feb. 6th. and 7th.

Everything about as normal with the thrashers and the road-runner. Lining of the thrasher nest must be about finished as work is slackening off.

Rhody, I believe, eats snails. At any rate he picks up their shells, breaks them up by holding them in his bill and slapping them against something hard. He does not hammer them as a jay does acorns with straight up and down blows, but swings his bill sidewise rapping the shell against the particular anvil selected. Furthermore he deliberately selects objects such as stones, and in one case, a drinking dish, against which to break them. When they are broken the interiors are explored for their contents. Thus far I have seen him only with empty shells.

I tried to round him up for Miss Dougan to photograph. He would permit me to walk up to him and even flick his tail without concern, but he would bolt when Miss Dougan approached.

with the camera. The first time, when she had no camera and he was sitting within reach in a tree, he did not object to her standing almost beneath him with me. I induced him to leave the tree and thereafter, although he would still allow me to walk up to him as before, he would make off as soon as Miss Dougan came into view. The attempt had to be abandoned.

July 1927

B singing and working intermittently at the nest.

Rhody was first seen sitting 12 feet from B's nest, facing it, but committing no overt acts. Later he cut foolish capers about the bushes, ^{striking} ~~making~~ heroic poses, repelling imaginary enemies and stirring things up generally. This annoyed the spotted towhees and wren-tits, but Brownie, who was now sunning himself on one of the low bushes about which Rhody cavorted, took it all phlegmatically. The thought suggests itself that the purpose back of these evolutions is to flush the small birds and thus cause them to reveal the locations of their nests. During pauses he always looks up into the bushes and frequently darts off in the direction from which bird sounds are heard, though never attacking the birds themselves.

On this occasion, after cooling down, Rhody climbed the dormitory tree. I went and stood under it. After sitting ~~quietly~~ in one spot for a few minutes during which he kept turning his head to look all about the inside of the tree, he climbed up to nest 9 (the roofed-over nest in which B sleeps at night). He went up and sat on it looking down into it and touching it inside with his bill. He examined the roof, then sat in the nest, as if to see how it felt. He looked at the roof overhead and around at the surroundings, shifted slightly once or twice and even reached out to move some of the growing twigs that interfered with his comfort. It was too tight a fit every place, but his actions were such as to give

the impression that he was considering adopting the structure for his own. When I left he was sitting just outside the nest. His going there (this is the second time that it has been witnessed, B being there the first time) does not augur well for the safety of any eggs or brood at this place while he is about.

Later (in the afternoon) he elected to sit for an hour or so on the front porch of his house in the orchard; this is only the second time he has been seen to use the house.

At sunset Brownie was singing and shortly afterwards retired to his regular nest for the night in the dorm.

Feb. 9th.

The usual early morning singing. About 9 it was over at Robinsons. B could be seen in the top of a pine there (about 250 yards away). His identity was established when, on call, he ran and flew (250 yards) to me for food, scripping loudly. He did not seem to know where Nova was and sang loudly from nearby shrubs, looking anxiously in all directions, until she came, but from the west. He then went down into the nest and called from there, but she did not appear as long as I stood near.

Rhody was still in his roost at 9:30. Mrs. Scamell says that her son saw him come out of the house which was put in the tree for him, yesterday morning. This and the two episodes here on the same day seem to show increasing interest in possible nesting locations.

The thrasher nest is to all intents and purposes completed, although a fibre or two may be added now and then in a casual sort of way. Practically all of the fibres that I distributed have been used. These consisted of the linings of two old thrasher nests, together with some additional material.

Feb. 10th.

Feb. 10th.

A beautiful day, warm and sunny, in contrast with some we have been having lately. Frequent full song by Brownie, much of it having for its object--as determined by results--the summoning of Nova to return from distant parts. She exhibits the same wandering characteristics of last year, in contrast with Greenie.

Rhody was unusually vocal, being inspired to full song at short intervals throughout the forenoon. He selected points from which he could command an extended view; all of them inside this enclosure. He did not object to singing in my presence and I got some movies of him pumping out his simple lay, also a still of him at the mirror. (p 889)

B was watchful of the vicinity of his nest, occasionally when appearing to be anxious, going there as if to see that everything was in order.

At one time he sat directly over my head for several minutes and sang full song.

Feb. 11th.

The usual early songs by B.

roost

Rhody in his at 10:30 refused to come down, though smacking his lips when I showed him meat. As a "compromise" I scaled the low wall, hung on to the railing and shoved the meat about 6 inches from his beak. He gobbled it at once, as I thought, ungratefully considering the effort I was making in his behalf. He would not even condescend to shift one of his feet to cooperate.

At 12:10, due perhaps to the energy absorbed from the meat administered earlier, he had managed to shift his seat about two feet to a point where the shade of the house no longer fell.

About 2 I nearly stepped on him on the orchard path. He did not retreat, but planted himself squarely in front of me ready to catch the worms which he undoubtedly knew would be tossed to him.



Rear view of Thody at the mirror.
Feb. 10th., 1935. $1/25$ sec., f 8, 3 ft.
Underexposed.



Thody by the mirror, Feb. 10th., 1935.
 $1/50$ sec., f 6.7, 3 ft., out of focus
and underexposed.

Feb. 12th.

No observations today other than to note presence of B (with song) and Rhody, and to feed them both before leaving for Leconte Thrasher territory in the vicinity of Coalinga as described by Dr. Grinnell in May-June Condor, 1933.; with Dr. Reynolds I hoped to see these birds and compare their song with the California thrashers.

Feb. 13th.

We were at Polvadero Gap about 5:30 A.M. and worked about through the widely scattered atriplex on the Guijarral Hills, seeing and hearing no thrashers. Dense clouds and rain threatening; a small, clear opening in the clouds at the expected point of sunrise; nothing but meadow-larks and cocks were heard. As the sun was rising a little after 7 in a gorgeous display of color, we went down into the gap where the atriplex was thicker and higher and a dry barranca, with a few cottonwoods growing in it, meandered. This proved to be the thrasher habitat, though we did not positively prove it until we had about decided that, owing to the dull and chilly morning, they were in cover and probably would not sing. We had heard previously a few calls which we suspected to have been made by these birds, since they were new to us, but no song. Finally a distant song was heard which seemed to be of "thrasher type" though differing radically from the full song of Brownie and his tribe, and perhaps an hour and a half later, we were rewarded by hearing the full song coming from a thrasher sitting on a bush about 100 feet away. The bird shortly disappeared in the bushes, but by the time the doctor had returned with the 6x glasses (which we had forgotten) he was again in full sight and song nearer than before, as we had moved up on him. We watched and listened for several minutes. He did not strike us

as particularly shy. In fact he was more easily approached than the crowned sparrows which were present in flocks and more approachable (by a hundred yards or over) than the phainopeplas (seen one at a time). Still later, while we were stealing up on another (?) thrasher a quarter mile west of the first one seen, and were in plain sight in the open, still another thrasher flew from some distance away directly toward us, passed a few feet over our heads, and went down in the barranca and began to dig just like Brownie. This one seemed to pay no attention to us, moving about freely in search of food. These two birds were in sight at the same time.

We found many old nests, perhaps 8, but nothing we could positively identify as new ones or nests in the course of construction. There were two nests consisting of foundation twigs only which may or may not have been new and may or may not have been thrasher nests.

Our only original contribution to ornithology consisted of a cottonwood tree containing 3 hawk's nest, a mockingbird, another small nest and a veritable wild-cat dozing in one of the hawk nest! This wild-cat was the tamest "bird" of the day. We bombarded him at a range of about 20 feet with pieces of bark, soft lumps of earth and "buffalo chips" scoring frequently for about a half an hour, without causing him to leave the tree. The most he would do was to rumble and growl, occasionally move out of the nest, then go back to it again and blink at us sleepily. We acknowledged our defeat and left him in possession of the field. A half hour or so afterward, our wanderings brought us again near the tree. He was still in the nest. A broadside by Dr. Reynolds, the first of the second engagement, caused him to become bored with the whole affair. He descended with considerable dignity and galloped off in a wide arc through the atriplex, of which we appeared to be the center. He was spotted by a raven, who circled about him and repeatedly swooped down upon him, following him for a hundred yards or so.

In none of the nests did we find bits of paper, at least where they could be seen. We had anticipated and commented on the probability of their containing cotton, as cotton is grown in the vicinity, and the very first one found had tufts of cotton in the lining, as did some of the others. All were from a foot to two feet above the ground.

These thrashers are distinctly smaller birds than Brownie and much lighter in hue. It may have been due to shadows cast, but they gave a definite impression of having ^a dark patches on the throat, and dark ear coverts.

They did not always sing from the low bushes; one was seen and heard singing from the top of a cottonwood.

The song, to my ear, bears little resemblance to the full song except when both are heard at a distance. of T. redivivum. It is of about the same loudness as B's half to three quarter song, though less varied and contained no imitations. It lacks entirely the brilliancy and unexpected phrasing of T.r's full song, but it is "sweeter" than his full song. It contained no "words". Undeniably a beautiful song, somewhat of the order of and less hurried. that of the purple finch, though less varied. It is, perhaps, ^{some} most like one of Brownie's sub-songs{ B has so many themes that it is impossible to say which one)--smoother and more rolling--more conventional--less wild --less range--no mimicry--more vowels and fewer consonants --fewer musical phrases that one is able to "catch" and far less of the unexpected. Curiously, when heard at a distance of say 100 feet, I doubt if I would have thought it a thrasher song, but at greater distances, when only the louder tones were heard, (which is how it was first heard) its resemblance to T.r. was sufficient to cause both of us to exclaim at once that there was the thrasher we were looking for. Dr. Reynolds, however, considers, I believe, that the nearby song resembles T.r's enough

to identify the bird as a thrasher on first hearing it .

As to which thrasher is the better singer, de gustibus non est disputandum.

Phainopepla at Paicines. As we passed through Paicines on our return , Dr. Reynolds

saw a phainopepla, but I was too busy watching the road to look at it. On our return he looked it up in Dawson and found that he reports it on the authority of Malliard as wintering along the coastal ranges to Paicines.

Feb. 14th. and 15th.

Affairs as usual in the local thrasher and road-runner cosmos. Thrasher nest visited occasionally by B.

Feb. 16th.

Ditto. Frequent full song by B at random intervals.

This morning Rhody greeted me with a soft rattle of the beak instead of his whine--the first for many days.

R's "rattle" This rattle serves as a greeting, as a sign of fear or displeasure and perhaps also of pleasure. It varies in intensity from a sound so soft as to be heard only a yard or two--when it sounds as if made by lips instead of a horny beak -- up to one that may be heard a hundred yards or more. It is not made often, sometimes not for days. It is sometimes a rattle only, sometimes with an aspiration and at others with a loud booh!

He has not been heard to sing since last noted herein.

here 10 months. He has been here now 10 months.

Feb. 17th.

Usual thrasher song.

Resumes song. Rhody also began to sing at about 7:30 A.M.

10:45. R has been singing ~~almost continuously~~ at short intervals up till now. Got movie of him singing from topmost snag of the old oak at 9:30. Ditto stills, ^{on lounge branch (1545-4)} When I came in to change a film he moved to the roof overhead, singing there for about an

Movie.
on roof.



RHODY between songs on old oak, Feb. 17th., 1935.
9:30 A.M., clear, 1/25 sec., f 11, about 40 ft.,
without filter, sun at back of camera.

hour before sailing down. Got a distant still of the house on which R will probably show as a small speck. Dis. from him about 175 yards.

He also sang on the ground at a distance of about 8 feet from me. The bill does not appear to open.

From the roof he can see for miles in practically all directions, and as the house is long and rambling, he has an elevated promenade about 200 feet long.

Recognizes me
at distance.

About 11:30, while out on an errand, I caught sight of Rhody on top of a 12 foot bank about 75 yards away, before he saw me.

He started to run as soon as he saw me, but stopped at once and waited until I passed below him on the sidewalk. Apparently he

instance of
theory (?).

had recognized me. He then came down the bank, stopped 6 feet away and searched the ground at his feet to see if I had tossed a worm

there which he had not seen. I have noted this action many times before and think there is no doubt that this is the correct explanation. I had not even made a gesture as if throwing him a worm.

I now gave him one and he retreated behind a bush as an automobile pulled up at the curb; so I passed on. On my return a half hour

sings with
lizard in bill.

later, he was just coming down from the upper garden with a lizard in his bill. (This was robbing my preserve, as I do not allow

lizards to be taken from that part of the garden). He stopped on the driveway in front of me and sang his song with the lizard still

carries lizard
in his bill.

This continued for about a half hour, though at different places as he climbed bushes and the old oak. At times

Plays with
lizard.

the lizard was placed on the ground and allowed to run and be caught again. Suddenly he came down from the old oak and ran to

solution of a
problem.

the cage, passing the mirror. He stood looking at the meat, still holding the lizard. The problem thus presented was solved by swal-

lowing the lizard and then the meat--a huge piece. After staring at the birds he looked at himself indifferently in the mirror, made

a feint at the rail through the wire screen, left the cage to return in a few moments and peck at his reflection. At this point visitors arrived (1 P.M.) and he bolted.

Feb, 18th.

The morning opened with song by B.

About 8:30 Rhody again mounted to the roof of the house and sang his, lonesome, mournful lay.

Returning from town about 10 A.M., R was seen out in the open field on a prominent point looking off over the country. I went to him and gave him meat. He crouched low to the ground as a sharp-shin or Cooper hawk passed overhead at a considerable height. I left him and watched from a distance. He sauntered slowly back to this place, requiring perhaps 10 minutes to cover 150 yards, and stopping every few feet to look about. As he walked up the driveway he watched the bank on his right, apparently for insects, etc., although he passed one large one after looking at it with interest. He followed the curve around to the dormitory tree where Brownie was sitting in his No. 9 nest (the one he occupies at night) singing. (Incidentally B stayed there about 15 minutes). R did not go up the tree but sauntered off to the lath house, flew up to the roof (He can fly upward) strolled aimlessly about there for a few minutes, then, apropos of nothing that I could see, emitted five or six rattling boos in rapid succession. Next he climbed the sparrow-hawk pine and called at irregular intervals from near the end of a horizontal limb about 30 feet from the ground for about 20 minutes, looking off in all directions. He sailed grandly down from here, frightening all the birds in the immediate vicinity, then wandered off in leisurely fashion, to the upper garden, where he drank and loafed (mostly lying down under a rhododendron) until about 1 o'clock, when he appeared to become hungry. and drifted away. I do not think that he had had anything to eat since

I fed him, though I occasionally lost sight of him for a few moments. His growing hunger was manifested by a growing interest in the cracks of the rocks about the lower pool.

2 P.M. (Temp. in shade in upper garden (patio) 67, with same thermometer in shade in orchard: 76). These two points are not more than 80 feet apart. The latter temperature causes Brownie and Nova to go about with open beaks and Rhody to seek the shade. Both kinds of birds find it necessary, however, when inactive, under these temperature conditions, to shift from sun to shade and vice versa as they get too hot in the sun and too cold in the shade--a characteristic effect often noted by human beings here--especially newcomers.

April 11.

Brownie opened the day as usual and sang repeatedly during the forenoon, using several phrases that I do not recall having heard before. Part of the time he seemed to be engaging in a contest with a thrasher a long way off to the south. Once there was a short burst of loud song in the same tree with him. (Nova?).

The distant song kept up for a long time, so I went to investigate. The singer was located in the top of an oak, due south, in the garden of a house approximately a quarter of a mile away. The bird was not more than 30 or 40 feet from the house, yet when a very pleasant lady, as it proved, came out to pick flowers, it developed that she had never heard the bird at any time. By this time he had stopped.

Rhody was silent and invisible during nearly all of the forenoon and was first seen coming out of the shrubbery in the garden with a small bird in his mouth! He allowed me to walk up to him and it proved to be a bush-tit. He removed a portion of the feathers and swallowed it whole. I doubt if he caught it alive, but the burden of proof is on him.

To top off this meal he went to the cage and got meat; watched the magpies and rail as usual and made feltsⁿ at the former from the top of the cage, climbed the old oak where B was singing. This caused B to leave, but he soon returned and sang while sitting about 6 feet from R. He then moved about 20 feet farther away and continued his song. This (or something) aroused R to sing also, for 15 or 20 minutes. R then came down and acted the clown among the bushes, tearing about in wide curves, booing and playing hide-and-seek on opposite sides of bushes with an imaginary partner. He soon subsided, and for the next couple of hours was as unexciting as an old hen.

9:00 P.M. Brownie is sleeping quietly in his nest in the dormitory tree. I did not see him go to the new nest at all today.
Feb. 20th.

A misty rain fell at intervals throughout the forenoon and part of the afternoon. This did not interfere with Brownie's song.

Rhody did not sing during the day at all. I found him in the cage about noon devoting most of his attention to the rail on the other side of the wire and ignoring the meat. He was following the rail as the latter moved back and forth near the wire, posing and displaying. The rail appears to reciprocate the interest to a certain extent. The mirror problem has now become much complicated for Rhody by the action of the rail in disappearing behind it as R follows him. R is intent on the rail and suddenly finds that it has disappeared and right where it should be there is a road-runner staring him in the face and touching bills with him. He stares at his reflection, pecks at it, then with a quick shift, looks behind it and the road-runner that he has just seen has changed into a rail. A "pulled" peck, and the rail moves off parallel to the wire (and to the mirror which is leaning up against it).

In order to follow, R must pass the mirror again and the rail momentarily disappears, changes again into a road-runner moving in the same direction as Rhody, but stopping and looking at him as he does the same, only to disappear as the rail comes into view again. All of this is very perplexing to Rhody, whose knowledge of optical phenomena is strictly circumscribed by his own experience. He pauses, stares at the rail and seems to be trying to arrive at the explanation of the mystery by a process of pure reason, in which endeavor he is, unfortunately, severely handicapped by inadequate mental equipment. On the present occasion this sort of thing continued for a full half hour before R gave up and went off to "think" with his back toward the cage. As if to relieve his mind, he suddenly ran up the old oak at tremendous speed and dived off the top into the glade. It looked like suicide, but when I approached, he was sitting calmly on the ground listening to the sounds of birds in the bushes and doubtless wondering when there would be nests to rob.

Brownie spied me and came for worms. Rhody watched this for a time, then came too without invitation. B did not altogether like the intrusion, but was compelled to receive worms alternately with Rhody, and somewhat suspiciously. R disregarded B.

R suddenly stretched to his full height and stared fixedly at something behind me. It proved to be a large cat about 50 feet away, which turned and ran, as I turned to look, toward the vacant lot to the east. To my surprise, R immediately followed on a slightly diverging course, down the driveway to the sidewalk at the entrance where he stood for several minutes staring up into the lot where the cat had gone. Tiring of this he suddenly ran swiftly along the street, due west, spread his wings after running about 25 yards, sailed for the next 50 yards in an upwardly curving arc not more than 3 feet above the street (which is level) at

the highest point, ran for a few yards more and again sailed, the total distance covered being about 150 yards. He then headed for his night roost, although it was only 2:30 P.M., sat for 10 minutes on the rail below it watching hawks and taking worms from hand. At 2:40 he was settled in his night roost--the earliest retiring time yet noted.

Feb. 21st.

Heavy fog in the morning, clearing up about 9:30 A.M., but B singing as usual.

Rhody came to me of his own volition without being called, about this time, and was soon followed by B, also on his own initiative. There was some restraint on B's part as regards R, but R paid no evident attention to B. They were handed one worm at a time alternately, B soon climbing the old oak to sing, Rhody, somewhat later, somehow (I did not see him do it) got on top of the tower of the observatory and called for 50 minutes. I trained the movie camera on him with a telephoto lens hoping he would get up on the weather-cock, but he sailed down and landed at my feet. (About 110 feet, along the line of flight).

Feb. 22nd.

The usual singing by B, but no activity at the nest whatever.

At 9:30 Rhody was sitting on the wind-screen which shields thrasher nest No.9 in the dormitory tree, calling occasionally. He sat there for three quarters of an hour, then moved to the small roof over B's nest and sat there for 25 minutes--hopefully waiting? Next he delivered a few calls from the screen again, then sailed down to the cage where I was sitting, got meat from near my elbow, passed by the mirror several times without getting excited about it--merely a casual glance in passing--and moved on to see what else there might be of interest.

In the afternoon he came to watch me digging in the orchard.

Refuses angleWhile he was curious about the angle worms tossed to him, he did worms.

not eat them. However he discovered a snail shell which the owner

Eats snails.

still occupied, tried first to break it on a clod without success

Cracks on stones.

and then deliberately moved directly to a small stone that was projecting above the surface and cracked it by striking it first on one side of the stone and then on the other with side swings of his bill and without releasing the snail-shell. His selection of stones as anvils has been noted herein before as has also his apparent recognition of the fact that he can accomplish results with a stone which are impossible to obtain with a soft clod.

After he had cracked the shell he ate bits of the snail and finally swallowed all that was left with a large part of the shell still adhering. So Rhody does eat snails.

Feb. 23rd.

Brownie opened the day as usual.

Mr. Engels , a student of Dr. Miller's came to see the thrashers.

Brownie works in nest 9 instead of 10.

When Brownie had had all the worms he wanted, he began picking up soap-root fibres, but not carrying them to nest 10. However, it was thought that he might possibly take them to No. 9, where he sleeps at night, and so it proved, for we found him there working diligently. This nest has never been fully lined. In a few minutes he got another load and took it up. Up to 5 P.M. I had gone to the nest 3 times more and each time he was either working in it, or as on one occasion, was going to it followed by Nova.

This opens the way for all kinds of speculation as to which is to be the nest, why and wherefore, etc. and so forth.

Rhody discriminates between persons.

It was early noted that Rhody showed fear of all strangers. There was, however, one exception, viz: Mr. Shirley Houghton. The first time R saw him near at hand he showed no restlessness in his presence. This fear of strangers extended also to Julio until he got used to seeing him about. In some cases it has amounted almost

to panic. As also noted, on such occasions his fear also extended to me, so that I could not approach him either. Yesterday Mr. Houghton, whom Rhody has seen not more than three or four times to my knowledge, suddenly appeared where Rhody was watching me work in the garden and the bird showed no uneasiness.

Today he passed by Mr. Engels and me, where we were seated by the oval lawn, but would not stop and would not permit me to get anywhere near him, maintaining his distance. Yet later in the afternoon, Mr. Will Sampson and I looked for him, found him sunning in the orchard, and although Mr. Sampson, it is true, stopped about 40 feet away, R permitted me to go up to him and flick his tail, merely walking off a few steps and stopping.

The foregoing, of course, proves nothing definitely and while it is true that he reacts differently in the presence of different individuals, it is also true that he is becoming more tolerant of all strangers.

Feb. 14th.

The thrashers were unusually quiet early in the morning. I interpreted this to mean that they were probably concentrating at one of the nests. However, a visit to both at about 8:15 A.M. failed to reveal either bird.

Meanwhile Rhody began his song from a pine in the garden, moved occasionally to different points of vantage and now (10:30) is singing from the roof overhead. A short time ago he was in a side-walk tree in front of the Scamell's, singing with a "gallery" watching from the windows. I went down and handed up a piece of meat to him, which he took to the delight of the spectators.

At 10 B was seen climbing up the dormitory tree followed so closely by Nova that they looked almost like one long, sinuous animal. Both went directly to nest 9. In a few moments Brownie came out and sang full song, but N did not reappear. I waited about 25

minutes before returning, choosing a time when B was going back to the nest after having looked me up, then peered up into the tree and saw Nova still in the nest. Now I wonder which is going to be "it"; No. 10 or No. 9. Incidentally, Rhody, who now (10:45) is climbing around through the bushes at the oval lawn watching the birds at the feeding stations, knows all about both thrasher nests. I fear he will prove to be the serpent in Eden. (Jan 20, 1936 - He did not)

During the rest of the day Rhody hung about the house and the garden most of the time. He has discovered that this house also has a porch with windows easily accessible for pounding purposes.

He also tried to get up on the roof by running and flying straight up the wall, but failed due to the projection of the eaves. It was not a wild scramble, but a smooth, almost silent, well coordinated attempt, seemingly made with little effort.

Brownie and Nova again showed joint interest in nest 9.

Feb. 25th.

10:45 A.M. Although a perfect day, there was almost no thrasher song to be heard anywhere. I returned from town about 9:30 A.M.--thrashers still silent and R calling from the observatory tower. A few minutes later Dr. Reynolds and I were looking for him near Dr. Scamell's when Mrs. Scamell appealed to us to hurry to Rhody's rescue off to the west, as her cat Tommy-Leo was after him in earnest, had chased him a long distance, R was badly frightened and making a high-pitched cry running for dear life. The cat even followed him up into trees. We got into a car and drove in the indicated direction, sighting the cat in the tall grass in the act of leaping at something concealed from us. The cat bolted for home when we were a few feet from ^{him} at tremendous speed although we had not even made a hostile gesture. There was no

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evidence of R; undoubtedly he had escaped.

Mrs. Scamell says the cat on arrival bolted at once down into the basement and that she would like to know what technique we used on him, as it was a new performance on his part! We had done absolutely nothing.

It appears that Tommy-Leo was eating a mouse on the lawn and Rhody was across the street 50 or 60 yards away. Mrs. S watched the cat dispose of the mouse, and glancing up, saw Rhody there near him looking at him. The cat began to switch his tail and sneak up on the bird, who was not alarmed at first. From that point onward the course of events is confused.

Passing thrasher nest No.10 on returning from the search, one bird was seen sitting in it quietly, but later it was empty.

About 2P.M., after an extensive search, Rhody was seen out in the field in the company of a flicker, both appeared to be getting plenty to eat. Rhody came in response to call, dawdling along the intervening 50 yards or so, catching insects and quickening his pace as he got nearer and presumably saw the meat. About half way, he greeted me with his "rattle-boo" and forged ahead uphill through the long grass. After swallowing the meat (only half of it), he caught a spider and strolled casually toward this place, getting quite a lot to eat. At one place he concentrated on something that had to be pulled out of the ground. He dug about it with his bill, swept the grass aside with side strokes like a thrasher, pulled off some of the leaves and devoted himself to hard pulling, his hold slipping frequently necessitating quick backward steps to preserve his balance. A large bus came down the hill and around the curve; Rhody forgot everything else, shot by me like a meteor with crest raised, his red, white and blue displayed, passed immediately in front of the bus, across the street and up the driveway to safety. Inspection of his operations showed that he had been trying to pull

up a half-buried twig. He seems to have forgotten all about the morning's fright. Also wild food appears to be abundant.

Feb. 26th.

No early morning song heard by Brownie or any other thrashers. I took this to mean, as it has on previous occasions, that egg-laying might be in process.

At 9:15 there was a thrasher in nest 9, lending support to the expectation, and none in No. 10. At 9:25 the bird was still there. No signs of any other thrasher about, so it may be that it is B in the nest.

9:45. It was.

4:05. No thrasher song as yet today here, nor any heard in the distance. The birds seem to be unanimous, so it does not necessarily mean that B's local affairs are keeping him dumb. No signs of Nova today, yet B has not even called here, though he visited No. 9 several times and sat in it for considerable periods at a time, just as though he were incubating and taking alternate shifts with an invisible partner.

Rhody has behaved much as usual, though he has been indifferent to the mirror, not allowing it to excite him. He knows that the glass is a solid substance, as he wiped his bill on it and also picked something off of it.

Feb. 27th.

A little early song. Very little during the day. Brownie visited both nests.

Mr. Engels here to study thrashers in the afternoon. He says Rhody showed himself and seemed indifferent to his presence nearby, looking at everything else but him-- sky, trees, etc.

Feb. 28th.

Rain during the night and still falling (1:30 P.M.). Notwithstanding, B sang frequently during the forenoon, but neither bird

was seen at either nest on my one visit to them up to this time.

Rhody wanders around like a lost soul, looking disconsolate and bedraggled, though he does take refuge at times under one of the shelters hopefully provided for him near the old oak, also under a garden bench. He evidently does not like my umbrella. He refused a water-dog (newt) offered by Julio, having just swallowed a large piece of meat.

March 1st.

Early song by B, presumably calls for Nova.

9:30 A.M.	B sitting quietly in nest 9
9:45	B still there.
10.00	Nest empty (of birds).
10:20	B climbs up to nest, Nova flies from the nest tree. B goes into nest. Comes out to sit on screen and call.
10:25	B gone; no bird in nest.
10:35	B on nest again, not quiet, but looking about in all directions. Left shortly. Not calling.
10:45	Going to nest 9--found B there, sitting in it, but looking keenly in all directions. Left him there. No calling by him. This nest has never been completely lined.
10:55	B is heard calling from neighborhood of nest.
11:00	He shifts to old oak and sings full song. Dives down to my knee and eats worms, having ignored all previous offers this morning. Takes two into bushes in glade. He and Nova, out of sight there, greet each other with h-a-i-g-hs.
11:06	I go and stand about 40 feet from dormitory tree and B almost immediately runs to it, climbs up, passes through the glass house to nest, followed in a few seconds by Nova, who has a sheaf of soap-root fibre. B carried nothing. Here is the feminine touch--she knew that the "house" was not properly finished inside. I left so as not to disturb them.

As with Nova last year, B is having a hard time keeping his wife on the job. Greenie was not like this at all. It will be noted that N would not lay any eggs in nest 9 when it was built late in the season, whereas Greenie acquiesced promptly in Brownie's October 1933 nesting activities.

12 M. B in nest. Since last note both birds have been in and out of the tree frequently.

3:25 P.M. Beginning to rain hard. R has just gone to bed. Brownie and Nova have been quite interested in each other and in the nest. Nova has carried lining

to it, apparently on her own initiative, as B did not accompany her.

March 2nd.

Early songs by both Brownie and Rhody. At one time both were in the old oak about six or eight feet apart each singing without reference to the others efforts.

About 9:30 A.M. Nova was sitting in the nest quietly.

" 9:40 ditto.

A 10 Nobody in the nest.

No observations during the afternoon.

March 3rd.

Brownie's vocal efforts, beginning early, seemed ^{to} have as their object maintaining contact with Nova and inducing her to come to him at the nest. In this they were fairly successful, although N would not remain long at the nest. (Nest 9, since 10 seems to be now disregarded).

About an hour was spent in observing the road-runner's hunting tactics in the "orchard", under extremely favorable conditions due to his indifference to my presence at close quarters.

The fruit trees, being planted on a steep slope, are in two roughly parallel, irregular terraces supported by retaining walls of rough stone 2 to 3 feet high, laid without mortar. (Dry walls). Lizards live in the chinks and come out to sun themselves on the rocks. Rhody has known this for a long time and has reduced the lizard population to a low figure, but there are a few left.

He works either from the top of the wall or from the path at the bottom. When working from the path he saunters at snail's pace scrutinizing the wall from top to bottom, moving his head as little as possible, depending upon the mobility of his eyes in their sockets to give him an extended field of view. He stops often; in fact he is stationary most of the time, extremely cautious and alert,

listening to all sounds, far and near. I am reasonably certain that he listens for sounds from within the wall. When working from the top his method is similar in general, but has one specific exception, due to changed conditions. Thus, in order to scrutinize the face of the wall and, at the same time take advantage of the fact that he is now invisible from its face, he sneaks up with great deliberation to peer down over the rim. As he approaches the edge, he very slowly lowers his head and rolls his eyes downward to their utmost extent in an effort to see if there is anything of interest there, with minimum exposure of his own person. Gradually he thrusts his head further and further forward, moving it from side to side so as to miss nothing. When he discovers that there is not, ^{being} which is usually the case, he straightens up and scans the general surroundings--bushes, trees, etc. On one such occasion during this observation period he caught sight of an Anna humming-bird sitting on a low limb of an apple tree. He immediately flattened down to the ground like a cat and began a slow stalk of the bird 15 feet away, maintaining this crouching attitude. When within about 5 feet, the hummer, who had been fully aware of approaching events, buzzed off. R straightened up and resumed his examination of the wall--this time from the path. He included in his survey also the wall where I was sitting. As I felt sorry for him in his failure to get a lizard (though delighted with the bird fiasco) I dropped him a worm or two, where^eupon he lay down comfortably in convenient hollow which fitted him nicely and disposed himself to receive future favors. Here, however, his expectations did not coincide with my plans. The humming-bird episode had looked as if he were really hungry and wanted the bird as food. I hoped, by waiting, to get some additional evidence on this point, such for example, as a renewed and intensive search for food on his own initiative, or an attack on the two wren-tits

that had been scolding him near the end of his lizard stalk. He suddenly rose, stared west, crouched flat upon the ground again, darted 10 feet to the west, paused and then continued in the same direction at great speed for 30 feet more only to stop suddenly as a hermit thrush flushed from under an ironwood tree. (Lyonothamnus). This also looked like business. I felt now that these activities directed against creatures of his own kind were, in this case at least, inspired by a definite intent to capture and eat them and that Rhody was really very hungry. Accordingly I went to the cage and found that the meat was gone;--probably eaten by golden-crowned sparrows and towhees who are getting most of it;-- in the expectation that if he were really hungry he would come there. As I was putting out more, sure enough, here he came trotting toward the cage. As I extended the meat toward him children's voices were heard in the distance and he snatched the meat from me and bolted off at high speed away from the sound to a point where the house was between him and the children, where he ate the meat. (The children were at least a hundred yards from the cage and entirely out of sight. He is always disturbed by juvenile voices).

March 4th.

B still having trouble getting Nova to lay eggs.

About 11 A.M. two deep, hollow, resonant notes were heard from the glade, of considerable volume and power. Something like: Coke, coke , but the vowel not quite o. It startled small birds in the surrounding trees. Rhody proved to be the author. This is the first time it has been heard from him.

Occasional occupancy of nest 9 by the thrashers.

March 5th.

A little song early in the morning, but a great deal during the afternoon when it was practically continuous for about an

hour and a half, beginning before four o'clock. B seemed to be in a song contest with a thrasher off to the south west and fairly extended himself. Both he and Nova went to nest 9 frequently and about 11:15 N was seen in it, staying there about three quarters of an hour longer. B was given worms, some of which he took up to her. Altogether it looked like a genuine nesting operation, but when B relieved Nova and then left after a few minutes in the nest there were no eggs in it. During this time B was very quiet, sometimes sitting on the screen near the nest as if standing guard. Rhody's presence about 25 feet away on top of the lath house lent some color to such a supposition.

R was about "all" of the time, sometimes making his mournful song when standing on the ground immediately in front of me. In making this call the bill is entirely closed. ^(See later) Once, for no obvious reason, he had a fit of "rattle-boog" in which the calls were uttered in rapid succession, giving the impression of an expression of intense disgust with everything in general.

March.6th.

The day opened with song notwithstanding a cold wind from the south. About 9 everything was quiet, a thrasher was on the nest and Rhody was squatting on the ground (where I nearly stepped on him) near the dormitory tree avoiding the wind.

At 11 A.M. a loud outburst of song from B in the direction of the nest. I went there to observe results but as Nova was sticking manfully on the job I did not risk disturbing her. B had shifted his singing post to a point where he was fully exposed to the gale on the south slope. The wind screen protects the nest on all sides but the south. That side is, however, fairly well screened by the tree itself and other trees to the south, so while the nest is swaying about somewhat, the wind does not strike it strongly.

At 1 P.M. there was still a bird in the nest. At no time today has the nest been seen empty. This looks like an egg.

At about 3:30 still a bird in the nest.

At about 4:10, Mr. Engels and I standing near the dormitory tree, Nova, in the nest, suddenly called in her typical high-pitched musical phrases. (The only thrasher I know that uses so high a pitch. It is peculiar to her). A short time before I had commented on her growing restlessness. Brownie at once answered from the glade, but did not follow the hitherto invariable custom of coming promptly to relief if within sound of the calling mate. In fact he continued to mess about indifferently in the glade even after Nova had left

First thrasher of 1935. the nest two or three minutes after calling. I went up to the nest and discovered the first egg of the season. As timed by Mr. Engels, 24 minutes elapsed (an unheard of interval of time) before the egg was again covered, and by Nova herself. B joined her at the nest in three or four minutes and took over the work of incubation. I can not account satisfactorily for this variation from standard pattern. It is strange also that they should have abandoned nest 10 and used 9 instead. Perhaps they will use 10 for the next one.

March 7th.

A lot of song by Brownie, spaced at wide intervals. Probably the silent periods represented in part occupancy of the nest by him.

At 9:30 he was at the oval lawn singing and when I appeared on the scene, came for worms uttering the first two notes of his A song: pur'-ple. I took this to indicate that he would probably, in his next full song, introduce his A song (or whistled bugle call).

Nova, on the nest, called loudly in her characteristic high soprano, a few minutes later: "Tuck, tuck, ka-deel, ka-deel, ka-deel, ka-deel, ka-deel"; an unusual repetition. B answered from the old oak at once with his A song, but did not show up at the nest for 5 minutes. Nova stayed there until he came, then slipped out

with a soft, scarcely audible (at 6 or 8 feet) ka-deel, (or ka-deeo). Rhody was in plain sight part of this time, sitting on a lath screen over some plants about 20 feet from the nest, but appeared disinterested, finally walking away toward the cage.

Shift was changed again in a very few minutes, Brownie going off to the south west about 250 yards to sit in the top of a pine tree overlooking his neighbor's territory and indulge in a long song contest with him lasting from a half to three quarters of an hour. I went down there to identify him. On his way back he serenaded the Scamell family from their deodar for 15 or 20 minutes, bringing the family to the windows to listen enthralled by his splendid performance. When he decided to come home (Nova had been calling repeatedly without making any impression on him) I induced him to come to me for a worm or two in the street for the benefit of the Scamells, who had not seen him in this role before.

On changing shift, Nova went to the old oak and sang, Brownie responding with song from the nest. This continued for several minutes, first one and then the other, finally subsiding. These songs were soft in character, but strikingly different in pitch and phrasing. Brownie's at times was so soft as to give the impression that it was not intended for an audience but was an expression of happiness and content.

No attempt was made during the day to see if a second egg had been laid, shifts having taken place without the nest being vacant for more than a few seconds at a time.

Incubation proceeded regularly.

Mar. 8th.

Early song as usual.

Rain and hail during the night. Mrs. Scamell reports that Rhody used the porch of his house in the oak for shelter last night and that he has been seen backing out of the house itself.

At 9:30 A.M. Nova was on duty. B again went to the same place off to the south west to enter his song competition with the other thrasher.

Rhody was singing in the oriental plane tree in front of the Scamells' at 9:40 and as I stood there talking to him, Brownie came running across the street and jumped up to my hand. Three times more during the forenoon while I was watching Rhody at different places, B came and looked me up. On one of these occasions when R rattle-boomed B gave a momentary start but paid no further attention to similar efforts on the part of R, who was about 10 feet away. B seems to have no fear of R at any distance beyond 3 or 4 feet.

Shift was changed at 10:40, neither bird indicating that it was desired. B slipped up to the nest silently and touched Nova with his beak. After a little bubbling she got out and B stepped in, looking at the eggs and apparently moving them with his bill. I slipped my hand under him, but the platform is too low to enable me to reach the bottom. (This nest is higher than its predecessor). B merely opened his beak once and showed neither fear nor annoyance. (These notes show that the birds make this same gesture toward each other).

Speculation on
relative ages of
Greenie and
Nova.

It has been noted that Greenie's song was of the same quality, pitch and phraseology (both musical and verbal) as B's, and that from the first she was believed to be a young bird. Nova's song, on the other hand, differs in all these respects from B's, and these notes record from the first the impression that she is an old bird. The difference in the songs of these two females suggests ~~that~~ again that Greenie really was a very young bird when she first began going with B, had not yet developed her own individual song and learned singing from B, whereas Nova, an old timer, learnt in another school and arrived here with individuality fixed.

Perhaps the fact of Greenie's first batch of eggs having all been infertile is further evidence of her extreme youth when she first mated with B. This fits in also with her juvenile eye-color, dependent attitude toward B and more ready susceptibility to taming than N. Greenie, perhaps through youthful lack of experience, did not know that thrashers are not supposed to rear broods in October and November, consequently she complied readily with B's desires in the matter, while Nova, as a sophisticated old hen, knew all about established custom and refused to have anything to do with Brownie's late nest until many months had gone by and the proper season arrived. (One wonders which bird won the moral victory, B or N, in adopting nest 9 for the first brood of the year instead of nest 10 and what was back of it all).

B and R get acquainted with Mr. Engels. In the afternoon Mr. Engels came to study the birds. He says Brownie took crickets from his hand and he offered Rhody a salamander, but finally had to toss it to him. R took it, slapped it on the ground, but did not eat it; presumably because he was not hungry. A little later R was quite at home in the presence of both of us, having now apparently added Mr. Engels to his list of persona grata.

Mar. 9th.

Coldest morning. The coldest morning of the year, the minimum thermometer showing a minimum of 33. This is unseasonable as the coldest weather should have passed almost a month ago with certainty. Some years more than two months earlier.

eggs in thrash-
nest. B sang frequently when off duty. About noon as he was taking Nova's place, I slipped my hand into the nest and managed to feel 3 eggs, B sitting on my hand and "talking" volubly in pantomime. Nova did not go away at once, contrary to her usual habit, but sat a foot or two off for several moments, presumably to observe affairs.

Rhody prowled all about the bushes, watched the titmice going in and out of their box, started to go up to it and changed his mind, boomed, sang and inspected the interior of the dining room from the outside with his bill almost against the glass. He seemed not to notice his reflection.

Mar. 10th.

The usual singing, regular incubation, etc.

Rhody spent hours in the aggregate lying on the ground in the sun, also singing from various places, including the roof.

As I was lunching in the "cloister" Rhody appeared unexpectedly walking rapidly by me, headed for the dining room. The French windows had been left open and he entered without hesitation, spending 15 minutes there looking around, but curiously, he devoted most of his time to quiet contemplation of the outdoors from the inside. He showed no nervousness at all, did not peck the glass and when it came time to leave, wasted no time in searching for a way out but went directly to the open window on the east side (he had been looking out the south windows) and passed unhurriedly into the garden. He had not been enticed in any way to enter.

I went down to see and hear the thrasher that has taken up his residence at Mr. Sampson's. This is the bird that arouses B's interest. I found him tame enough to allow approach to 15 feet or less without his running away and he had no hesitancy in singing almost continuously for a half hour in my presence. I suspect that he is one of B's offspring that I have tamed in the past.

His full song is much more like the mocking-bird's than B's. I could identify only two of B's minor phrases (musical) tentatively and none of B's words. There was no mimicry, but he is a very fine singer, differing as much from B, I would say, as the Le Conte thrasher and more like the latter.

March 11th.

4:15 P.M. Less than the usual amount of thrasher song, in fact very little. B when off duty has been rather quiet. There is also little sub-song now.

R continues to call at intervals from high places as well as from the ground in the open field, also with a lizard's tail in his bill. At 2 P.M. I found him "resting". When I approached he began to look about his feet as if to see whether I had tossed a worm that he had overlooked. However, this time, he picked up the squirming tail of an alligator lizard, probably having disposed of the rest of the animal before my arrival, since he was not hungry. He wandered off with the tail, showing no disposition to eat it. I watched until I got tired and quit. One hour and a half after he picked it up, he suddenly appeared at the oval lawn where I was sitting still carrying the precious tail. After a few minutes he trotted off along the driveway in the general direction of the cage still with the 6 or 8 inch tail. I followed a few minutes later to see if he would repeat his performance of Feb. 17th. with the small lizard, but was too late as he had already accomplished whatever he had intended and was now staring at the rail with no lizard tail to be seen. A few minutes later he went in for more meat and presumably had swallowed the tail as an appetizer.

March 12th.

Thrasher song in "all" directions in the morning before sunrise, but little during the day. Incubation proceeding regularly. B and N very quiet.

Rhody is calling more persistently now and wandering about the place and its immediate surroundings, calling and listening. He is now singing more frequently in the afternoons than before.

Pat (Little Brownie) gradually wandered away from the Reynolds place just about the same time as the strange thrasher was begin-

ning to be heard in Sampson territory. His exoduses, in so far as they were observed by Dr. Reynolds, leads him to believe that the Sampson thrasher is really Pat. From the relative tameness of that bird (perhaps absence of wildness is better) I am inclined to agree, especially as this is the first time that a thrasher has paid more than a fleeting visit to the Sampson place.

March 13th.

The first two paragraphs of yesterday's notes apply equally to today, with the addition that Rhody is getting still more keen on the job.

About 5 P.M. he left his post at the front porch of this house and started apparently for his roost. Since about 8:15 A.M., when he took up his post on the observatory tower and called until about 10 A.M., he has been wandering about searching everywhere, including this room about 20 minutes ago, calling, listening and scanning the surroundings near and far. In the aggregate he spent probably 3 hours on the roof, having been up and down repeatedly. There have been several new manifestations by him today, not observed before.

First: a single low-pitched, very soft call made without lowering his head, audible perhaps 30 feet if everything else is quiet. Something like: Hroo or hrooh. A pigeon-or dovelike sound.

Second: a four note call of similar notes, gradually rising in pitch, the fourth drawn out longer and vibratory seeming to contain palatal r-r-r-rs. This is also soft and low and is made without lowering the head also.

Third: a new display consisting in taking a few steps forward on the ground, straightening up while in motion and striking the backs? of the wings together three or four times in succession. When first seen and heard I thought he was striking his sides, but nearer view showed that the wings met behind his back. This makes a loud sound, but less sharp than that made by a pigeon.

March 14th.

Except for an occasional full song early in the morning when he happens to be off duty, B is ^{now} very silent, not even talking to me when he comes for worms. Changes of shift, contrary to expectation and to previous observations, is now usually made without preliminary sound by either bird.

Rhody continued to wander about the place restlessly with quiescent periods of a few minutes to an hour at a time, searching and scanning the surroundings, though much less vocal than yesterday. He also played with the mirror again.

fous hum-
here.

At the present time there are three kinds of humming birds at this place: Anna (resident), Allen (regular summer visitant) and Rufous (migrant) now passing through. A gorgeous Rufous, like a living flame, was frequently in a blossoming flowering crab-apple.

March 15th.

Brownie sang full song very early at the Scamell's where he went to exchange songs with the Sampson thrasher.

Rhody began his calling also about sunrise.

About 9:30 he came to me for something to eat and sang his regular song repeatedly at arm's length, singing "between worms". This song is quite resonant at close quarters; he works hard to get it out. The first few coos at least, are definite coos beginning with a positive k sound. Some of the following ones, especially the last one, which fades out and flattens, may not begin with a k. Almost invariably there are 6, 7, or 8 coos.

His wing-clapping gesture continues to be used occasionally. So far it has consisted of two to four powerful beats, say, one too two seconds apart. Before making each he "gathers" for the effort by spreading his wings horizontally or by trailing them at his sides, lowering his head at each as if ^{to} devote all of his energy to the beat. The sound emitted is "flup!"

Thrasher Nesting Cycle.

In the following table only the beginning of the cycle for the three years is noted. The start of the first nest for the year is taken to be the date on which nesting activities have ceased to partake of random character (which may have extended over a period of several months) and have become coordinated and concentrated upon one structure. The fact that in this year's cycle the first set of eggs was laid in nest 9, which was started in Sept. 1934, instead of nest 10, which was started in Jan. 1935, is ignored in this table, though not in fact. The cycle is also based on Brownie's activities, as the head of the family. Thus although the second of 1934 was with a new mate, Nova, and it may have been her first for the year, it was, nevertheless, B's second; so she does not appear until she becomes the layer of the first egg.

Again, the table does not show, what appears to be the fact, that as far as the male is concerned, the nesting period is "all the time".

<u>Year</u>	<u>Nest begun</u>	<u>First egg</u>	<u>Male bird</u>	<u>Female</u>
1933	Feb.12	Mar.8	Brownie	Greenie
1934	Feb.12	Mar.1	"	"
1935	Jan.31	Mar.6	"	Nova

Interesting
behavior of
Rhody.

At 12:20 Rhody appeared in the upper garden (sometimes referred to as the patio) singing, with a lizard in his mouth. He carried it into the dining room after pausing at the open window

New tail-
swinging gest-
ure.

swinging his tail horizontally, i.e. wagging it sidewise like a dog, at the rate of about ten wags in 5 seconds. This is a new

Lizard carry-gesture. He came out in a few minutes and went to the south window

Window tap-
ping.

of the dining room and tapped the glass with the animal still in his bill. Next followed a stroll about the garden and a repetition of the window tapping. The impression gained was that he had seen his reflection from the inside and had gone around to the outside to look at the "other road-runner" and found that he was now inside, because he tried to jump up on the glass when outside.

Upward flight. He next flew upward about ten feet to the low part of the roof and tapped on a bathroom window still with the lizard. He moved to the parapet of a balcony and from there flew upward again to the main roof, remaining there for perhaps three quarters of an hour or more, calling but never dropping the lizard. Next he flew down almost vertically to a point near where I sat making an easy and graceful landing.

landing --surely he trusts his wings implicitly---and with good

reason. He next carried the lizard to the Scamell house and spent several minutes tapping with it on their dining room windows. (It was noted that he selected appropriate rooms at both places). He had three more interested spectators here. But before this I should have recorded his visit to the running-board and fenders of an automobile in front of the Scamell's where he again wagged his tail in the new gesture. He wandered about in the field for a time and then returned to the motor-car where two of us were ^{now} standing. He appeared to be looking for a customer. Next down the sidewalk a hundred feet and up a bare tree, cooing; then across the street to the lot west of this place. There I joined him and sat in the grass. He walked up to me with the lizard and sang "in my face".

By this time I had about decided--it was now one and one half hours since he was first seen with his prey--that the lizard was being carried about as an offering to a prospective mate and not because he was not hungry. As a crude sort of test I offered him a worm, with the result that he promptly ate the lizard and then took the worm, following with several more, showing probably that he was hungry and lending a certain amount of support to the theory above.

The lizard was carried continuously for an observed period of one hour and thirty two minutes. How much longer is not known. While on the roof his song was repeated at the rate of three to four times per minute, and was not interfered with by the presence of the reptile in his bill.

March 16th.

Brownie appears to direct his early morning song toward the Sampson thrasher, going part way (about 250 yards from the nest) toward the Sampson place, perching in the top of a pine at the Edwardes' or in a deodar at the Scamell's. There he sings for an hour or more, loudly and persistently, without mimicry. He seems

excited and will come down to me only after long and continued urging. Even then he may only snatch one worm and go back immediately to his loud song.

Repeats 9 coos. Rhody has extended his vocal effort so that at times he utters nine coos in succession.

March 17th.

Great song effort B. near the south western margin of his territory, in one or the other of the trees above referred to, fairly outdid himself this morning. He allowed Nova to bear the brunt of incubation for one stretch of 2 hours or more before relieving her. In the afternoon again he paid his respects to the Sampson thrasher, who responded vigorously, but B did not go so far to the S.W.

Modifies

Rhody performed as usual throughout the day. It was noted that there is sometimes a slight k on the end of some of his intermediate coos. Also a new sound, especially when he sings his loudest: a nasal, extremely high frequency termination of three or four of the intermediate coos, as if there were some very ~~xxx~~ small, light, loose part of his mechanism that was responding sympathetically in high overtones to the vibrations of his fundamental notes. (Like a loose part on a musical instrument).

March 18th.

Early songs, B and R.

B again sang loudly off to the S.W. in the morning.

Rhody began his song (as yesterday) at about 7 A.M.

Now distant range of R.

He went over to the Covell's (next to Dr. Reynolds') this morning, the first time he has been seen there, or so far away, since

Increasing tolerance of strangers.

his first arrival. About three quarters of the way over I gave him worms in the presence of Dr. Reynolds. Rhody then discovered a

gopher

gopher poking his head up from his burrow, but was only mildly interested, continuing on his journey. In about a half hour he

carries bush-tit about.

was back here carrying the desiccated carcass of a bush-tit. (10:15)

This he carried up the old oak, then to a window of the tool house,

to the top of a gate, to the parapet of the tool house roof, to the pergola surmounting it, to the observatory roof, there to call for a half hour. When last seen he appeared to be making for the Scamell's (to offer it to them?), but was not followed. It was noted that he again used his new, horizontal tail wagging.

and magpies. About an hour later he was back again, this time on top of the magpie cage pretending a great desire to get at them, which, from a previous observation recorded herein, fades out to nothing when he is allowed to get on the same side of the wire with them. After a half hour of this bluffing he retired to the old oak's topmost snag to "sing".

his performance About 2 P.M. he announced his approach to the cage again with one loud rattle-boo, and up to 4:30 was either at, on or in the ^{active,} cage, all the time except for about 15 minutes rest on top. During this period he was trying to decipher the rail-mirror combination, flirting with the magpies and trying half-heartedly to get in with them. He has not lost interest in the mirror at all. The whole set up: mirror, cage, magpies, rail and to a lesser extent: mocking-bird, not to mention the meat, forms a configuration which severely strains his intellect, but fascinates him at the same time.

Rail's bath session. About 4:20, as the shadows of the trees were encroaching on the sunlight in the cage, the rail decided to bathe--just as it was getting chilly. He made rather ineffectual efforts to dry himself, and when he began to shiver, went into the cold water again. A window sash was placed to shut off the breeze at a still sunny corner and he took refuge behind this; but as he still continued to shiver, went into the water again for the third soaking! (Rhody came down off of the roof to investigate the rail-sash arrangement). I let the rail out into the outer compartment where the sun still shone and he found the mirror quickly. His first reaction was a start of fear on seeing his image. He then investigated, nibbled at his

Rail and
mirror.

reflection and slid the top of his bill (culmen?) up and down the glass. He went back to it several times, was manifestly curious, but not nearly so excited as Rhody is. He was still dripping wet and shivering, but went back into the pool for a fourth soaking. I gave up trying to make it easier for him to dry himself after that.. I wonder if he has a fever and this is abnormal.

March 19th.

B sang full song at times when off duty.

R sang from the observatory tower early in the morning and from other points during the forenoon and part of the afternoon. About 10:30 he again showed his intolerance of children by running off from the place when a small boy arrived.

Later he decided to investigate the probability of finding a mate off to the north, and when several persons were seen coming out of a house about 150 yards away and staring up at the roof, he was found to be the center of attraction. He called from there for perhaps 45 minutes and then disappeared. I was unable to find him anywhere after a pretty thorough search.

About 1:30 I was in the cage and he appeared quietly looking in|through the wire at me. He merely rolled his eyes at the meat offered him through the mesh, coming promptly into the cage instead and taking another piece which was on a rock beside me. He next admired himself in the mirror without display or pecking and then lay down comfortably for a long rest near the door. It was not fear that made him reject the proffered meat, I think, because he immediately adopted a much more hazardous course by coming into the cage with me. It will also be noted that he is able to regard the mirror calmly.

²⁰
March 19th.

Early songs by both B and R, the latter first heard from the tower, now becoming a favorite post for him.

About 11 A.M. I watched Rhody on the ground six feet from me. He wanted neither worms nor meat, having already visited the cage.

R spots hawk. I test of his powers of association. He soon spotted a hawk high in the air above. When the hawk disappeared I imitated the road-runner's attitude in looking at a hawk, several times, to see if Rhody take the clue from me and look up himself, but he disregarded my significant posturing, evidently either attaching no importance to it or else not associating it with hawks. Curiously enough, while engaged in this procedure, he suddenly crouched flat upon the ground and looked fixedly behind me; I turned and there was a real hawk sitting forty feet from me on a low limb of an oak. R did not seem much concerned, as he stood up in a few seconds and did not retreat. The hawk flew past us about 20 feet away. R stepped under a bush quickly, but did not freeze or appear to look for the hawk. I spent 15 minutes looking for the intruder with a gun unsuccessfully. On returning R was still in the same place, but taking the affair philosophically; in fact appeared to doze at intervals with closed eyes as if entirely off his guard. Nevertheless, I noticed that when I emitted a puff of smoke during one of his "shut-eye" periods he aroused at once.

only lower lid moves voluntarily. When he dozes off, only the lower lid moves. It creeps up very slowly until the eye is covered by it.

March 21st.

3 eggs after 15 days incubation. nest 3:00 P.M. There were three eggs in the thrasher just now; ascertained by feeling in the nest as B took over from N. This has completed the fifteenth day of incubation. If the incubation period is the same as with the first brood of last year there should be a youngster in the nest tomorrow morning.

Very little song by B so far today, though there may have been some not heard by me.

Rhody also has sung very little today, although he spent several hours continuously at the mirror and the window sash. The placing of the last has added a new complication for him to unravel. It adjoins the mirror, is at right angles to it and is outside the cage leaning against the wire. This combination now gives Rhody another phantom road-runner in addition to the first one, so he goes from mirror to sash, back and forth, tapping at each. He rests by going to look at the magpies, panting with open bill.

March 22nd.

I did not hear B singing in the early morning, though of course, this does not mean that he did not. R, however, did.

Double incu- At 9:30 A.M. both B and N were in the nest side by side giving the eggs a double dose of heat. It did not appear to be merely an incident of changing shift, as both birds were motionless and I watched them for several minutes. At 10 only one was incubating. This is the morning on which the first egg should hatch, and one wonders if the "double" incubation has any significance.

Will ill. The rail was distinctly out of sorts; weak and wobbly looking, with loss of appetite and a tendency to doze, puffed up, with bill under one wing. (Not under the back feathers). He was put in a cage and brought indoors, the cage covered and an electric light placed underneath it. Now I wonder if the repeated bathing above recorded was not a symptom of illness after all.

First thrasher hatches. I did not examine the thrasher nest until about 2 P.M., at which time B was coming on duty. There was one chick (and two eggs). B appeared to look with pride down into the nest, prodded about a little, then "rubbed" himself down into it thoroughly, facing me. I offered him a worm, which he reached for eagerly as soon as he saw it, eating it himself. Two more worms were similarly treated. Evidently it is too soon to feed the youngster. Certainly B did not give him any food by regurgitation, either.

ail dies

The rail was kept comfortably warm. It did not move about the cage at all and did not seem to suffer. Its breathing was deep, slow and regular, yet it died about 5 P.M. Its plumage was in perfect condition and its body was plump. Yesterday it seemed perfectly normal. It was a very gentle and friendly bird--a great favorite with all, and was to have been released shortly.

March 23rd.

Early song by Rhody, but nothing heard from B, not even his approach call when going to the nest, and no undersong.

When I offered him worms the first time, he took only two, prepared them on the ground and headed for the nest. They're off again.

Mocking-bird
followed.

About 10 A.M. the door of the mocking-bird's cage was opened and in about a half hour he was out and in a nearby pine tree, then disappearing. The loss of the rail caused me to liberate the mocker sooner than intended. Immediately the cage was "filled" with towhees and golden-crowned sparrows.

About 5 P.M. he was back on top of the cage apparently trying to get back in again and also much interested in the magpies (like Rhody). Finally he discovered the door and went back in by the rather devious course which it was necessary to follow and showed no intention of coming out again. This was just what I wanted. I know he will be comfortable for the night, with plenty of food, and will let him out again in the day time, keeping food for him in the cage if he again decides to return. Perhaps he will then make this place headquarters as Rhody does. The original plan contemplated releasing a pair here, but, for various reasons it did not work out in that way.

Rhody again made a long expedition to the south east only to return in less than an hour. He is getting much tamer in the presence of visitors and gave fine exhibitions of mirror-dancing for two different visitors at different times, in their immediate presence. He also boomed and sang, faithfully supporting the tales which I have told about him.

Brownie also backed me up by jumping up into the hand of a visitor for a worm. I had assured this one that he would do it, but he was skeptical. Aside from a slight pause to assure himself first that it was the visitor that had the worm and not I, he did

not even hesitate.

Second egg
incubated.

Late in the forenoon the thrasher nest was found to contain two youngsters and one egg. While standing at the nest with Mr.

Fairy chorus
sings.

Engels, both of us verified the beginning of the fairy chorus. Yet the older bird was only slightly over one day old. Without checking back over the notes, this seems to be early.

Time of first
nest not affected
by taming

Mr. Engels says that the two eggs in the thrasher nest which he found in Berkeley have hatched, and apparently a day or so before these. This is interesting as tending to show that there is nothing exceptional about the beginning of the nesting cycle of my birds. I had wondered whether the semi-domesticated conditions under which they have been living (especially in the case of B) might not have had some tendency to cause earlier nesting than in a perfectly wild state. Apparently they have not, and after all, B and his mate are, and have always been, absolutely free.

Bullock oriole
arrival.

Walter Moore, a young boy scout who seems to have an unusually wide acquaintance with local birds, and surprisingly accurate in one so young, says he found a male Bullock Oriole in Dimond Canyon and approached it closely Wednesday before last, that is : Mar. 13th. Mar. 24th.

Rhody was first heard singing at 6:30 A.M.

3rd. chick
hatches.
16 days is
incubation
period.

Little was heard from B during the day, since he was too busy feeding the young thrashers, the third having hatched on schedule time, making exactly 16 days incubation for each egg.

Since the advent of the new brood my prestige with the thrashers seems to have advanced enormously, especially with B, who now makes me a regular port of call without solicitation. In a few more days when the young birds really begin to eat, B will be a persistent solicitor of worms.

About 4 P.M. I was sitting near the cage with a golf club across my lap, watching to see if the mocking-bird would come out. The

head and suddenly became very heavy and the club began to slide off. Brownie was sitting on it waiting for worms! He made several B and R. trips back and forth, thus attracting the attention of Rhody who was lying on the ground about 10 feet away. R came over for his share and made a half circle around B with his belly on the ground, following with a few ground loops in the same posture. This is a repetition of his action toward the pigeons noted herein. Perhaps it is an intimidation gesture.

Earlier in the day, as we were having a late lunch, R was seen outside with a very small lizard in his bill. A few minutes later he was heard (and seen) running on the floor overhead. He had invaded a bed-room and a bath room. He came down with the lizard and then went up to the roof again with it. More than an hour after he carried it to the cage where he, this time, added a piece of meat to the burden. (Because the lizard was too small?). He admired himself in the mirror with his new decorations without pecking his reflection and then wandered off, but was not followed. Over an hour after this I went in search of him and found him down on the south bank still with the lizard and the meat. He greeted me with two very soft hroos. He had carried the lizard for about two and a half hours and the meat with it for more than an hour. Shortly before 4 he came to the cage for meat which he ate at once. His former burden had disappeared. During the carrying period he had persistently wagged his tail horizontally in the new movement which, so far, has only been seen when he has had one of his carrying behaviors with "game" in his bill.

The addition of the meat to the lizard, irresistibly suggests that the latter was not considered large enough for a suitable offering either to a prospective mate or to nestlings. When he does this carrying he seems to be hunting for some one to whom to give

the food. As this is the first time he has been seen apparently dissatisfied with the size of his catch, for the first time it occurred to me that perhaps there is some sort of an instinct at work within him which causes him to gather a supply of food such as would be suitable for nestlings, if he had them. In other words, this carrying behavior, in its latest manifestation, now may represent the working of an instinct which warns him that sufficient time has elapsed since he began calling a mate for there to be young birds to feed.

The horizontal tail-wagging is just like that of an interested or happy dog and the first impulse is to ascribe to the same emotions, and perhaps it should be. Why not?

Although the door of the cage was opened, the mocking-bird did not come out. The door was closed for the night.

March 25th.

12:30 P.M. R was heard calling about 7 A.M. He visited the cage and played with the mirror by 8 A.M.

Mocking-bird. The mocking-bird decided to come out of the cage, but by 12:30 out and in. was back in again. He was in and out several times during the day, being inside at nightfall when the door was closed for the day. The certainty of finding food in the cage evidently appeals to him. This bird has never been tamed; no effort having been made in that direction.

No full song heard from B, who continues to do most of the feeding.

March 26th.

R's early song. Rhody began his morning song (or at least was first heard) at 6:15 A.M. from the observatory roof. Until 10:15 A.M., when I left not to return until 5 P.M., he spent practically all of his time on the roof calling.

Mocking-bird. The mocking-bird was out of the cage at about 9:30. Julio reports that he returned shortly after I left, and stayed there.

Within 5 minutes after my return Brownie found me and needed lots of worms for the nestlings. They have grown like weeds and are able to rock Brownie about when he covers them. The fairy-chorus is now well developed.

March 27th.

Early song was heard by Brownie about 6 o'clock. It is possible that I do not hear it at times although he may be singing.

Rhody, also, began the day with song from the roof and kept it up most of the morning.

B now looks me up constantly for food for the nestlings. He is decidedly spoiled.

Rhody and
Brownie.

3:30 P.M. Three times today, so far, Rhody has noted B's activities about me and has come of his own accord to investigate possibilities for himself, planting himself beside me to await events patiently. It is amusing to watch R and B under these conditions. There is a certain amount of mutual suspicion. R chased B away twice, but did not make a vicious attack. B avoided him easily and did not leave the field. After the last one R rushed off to make some of his evolutions through the bushes.

Mocking-bird.
again returns to
cage.

The mocking-bird's cage door was opened at 9 A.M. He was not seen outside until about 5:30 P.M., seeming to prefer to remain inside. At 6 P.M. he was not to be seen anywhere.

Creatures of
habit.

9 P.M. Birds certainly are creatures of habit. The mocker is in the cage in exactly the same spot where he has always slept.

R in regular
roost.

Rhody is also in his regular roost. Since it was located several months ago he has been seen to roost elsewhere only two or three times and has been absent twice.

Before retiring he again came for worms on seeing B doing likewise. This time I was sitting on a low bank, R and B approaching from opposite directions as B was returning from the nest. They did not see each other until B jumped up on to the bank 18 in-

ches from R. R appeared to be more startled than B , but recovered his poise quicker.

March 28th. to 30th., incl.

Due to absence no notes taken on these days, but on my return after 6 P.M. on the 30th., Julio reported that there were only two young thrashers in the nest. Accordingly I went to the nest at 6:30 P.M. and found Nova in it. She stepped out as I advanced my hand and Brownie immediately appeared, jumped on to my hand, began pecking it as hard as he could, seized one finger and squeezed it hard trying to "throw it away", clearly much annoyed. I withdrew my hand, he settled in the nest at once, immediately took proffered worms and fed the young, forgetting his previous discomposure. Only two chicks were in the nest. The answer may be:

- (1) One removed by Nova as suspected in the case of nest 8 (?) last year, or one died and was removed.
- (2) Rhody or a jay.

Mocking-bird. The mocking-bird was back in the cage, having been released every day.

Occurrence of
Mockers.

(Incidentally, while away, the mocking bird was found throughout the Santa Clara valley from Niles to several miles south of San Jose, in full song, about the houses and settlements.

Ditto the west side of the San Joaquin valley from about Tracy to the highway leading to Pacheco pass.

Ditto from the southern end of the same valley along the highways on the east side and the middle up to Tracy.

They were "everywhere", not looked for especially, mostly seen casually while driving along the roads).

Wild flowers.

This trip was taken primarily for the purpose of seeing and photographing in motion picture color, the wild flowers, for which, due to plentiful rain fall, this has been an especially favorable year. A distance of about a thousand miles was covered. To one who has known the immense sheets of vivid color spread over the landscape for hundreds of square miles in the past, the destruction of the past 50 years due to grazing and cultivation of the soil comes as a frightful shock. It may be said truthfully that, with the exception of remote, uncultivable and almost inaccessible regions, all this is gone forever! Formerly, except in cities, one might say that everybody, in season, had this color extending from his own door-step for miles. The deep and rich bottom lands were covered with sheets of yellow, orange, purple, blue, cream, white, red and intermediate hues and shades, in addition to the waste lands, but now it is only a small part of the very worst (agriculturally speaking) waste lands and the thin-

soiled, rocky heights (and then only in exceptional years) where the former displays of color are to be seen. Evenso, there are still a few such places where, on hill-sides, huge fields of color show plainly even at distances as much as twenty miles away. But they are scarce and now becoming the inspiration for pilgrimages, and, on Sundays and holidays, some roads are almost blocked with traffic. For example: Last Sunday, the Ridge route from southern California into the upper end of the San Joaquin valley. Special police, guards, signs, Chambers of Commerce, forbidden areas, looting of fields and withered flowers scattered along the roads by motorists, highway equipment with scrapers and blasts of oil flame destroying the remaining narrow sheets of color on the shoulders of the roads to the bordering fences where the adjoining property owners have not been able to reach with their plows; flocks of sheep pulling everything up by the roots in places where the flowers have had their first season of ample rainfall for years and are making their last stand. Etc., etc.

March 31st.

Another road- 11:20 A.M. Twice this morning I have thought I saw Rhody running away from me, only to find him in another place immediately afterward where he could not possibly have arrived in time. Just now I was sure I saw him 50 yards west of the west fence, skulking in the bushes. I turned east, when he would not come, and to my right, his rattle-boo sounded from an acacia. He was sitting, in what looked like a good place for a nest, "muttering". I wonder if he has really conjured up another road-runner. He has not been heard to sing this morning; possibly that is some evidence. I have thought, that, due to the scarcity of his kind in this locality, there was not the remotest possibility of his getting a mate.

A little later R was not in sight anyplace.

At 12:30 R was sitting quietly in his new "nest" location, and when he saw me, hopped from branch to branch to get nearer without my having shown him worms. He remained in the tree as I left.

At 1:30 he climbed to the observatory tower and began to call. After this he went to the lot to the west and called from a tree there. He was silent during most of the rest of the afternoon. At what should have been his approximate bed-time, I went to his roost, but he was not there.

At 5:40 he was still absent; this was a definite departure from routine. About 5:50 I saw him sitting on the crest of the bank of the west lot with a lizard in his mouth--very late hunting--exceptional. I went to him and he hrooded softly. A passing car caused him to retreat into the bushes, but he came out to the same post in front of me and again hrooded. Next he carried the lizard up into my place and disappeared for a few minutes, then reappeared without it and wiped his bill on the paving in the middle of the street. He went to his roost at 6 P.M. exactly. All of this is, in some detail or other, departing from established behavior, and may be in some way related to the "new" road-runner which seems to have come here.

Mocking-bird.

At about 5 P.M. the mocker had returned to the cage.

April 1st.

2 road-runners at the Reynolds'

R was heard calling early in the morning, but the sound soon ceased. Not long after (about) Mrs. Reynolds phoned that there were two road-runners there. I went over to get details, and there is no doubt of the fact. They thought one of them was Rhody because it was relatively tame. In any case, there are ,at present at least, not less than two of the birds here. I undoubtedly saw a stranger twice yesterday and Rhody's behavior is connected with that bird. Perhaps the miracle has happened and he has a mate.

9:35 Rhody seems to be away still.

Rhody here with mate! At 10:02 precisely, after having sneaked up carefully toward

the suspected road-runner tree, a road-runner was spotted about 15 feet from it and almost at once, a second one. One of them was fussing about with its bill in some litter. Neither of them saw me and I stole away carefully to leave them to their own devices. And this is April Fool's Day. Yesterday I placed a lot of twigs

under the nest (?) tree, hoping they would prove an attraction.

The lizard-carrying behavior now appears definitely to be a part of the mating behavior.

twig carrying At 11:00 A.M. one of the Rhodies was seen pulling a twig out
nesting.
of a bank and running off with it in the general direction of station 1 (the acacia first referred to) about 25 feet away.

Nest site At 11:45 both were picking up twigs near there--one inside
uncertain.
the fence, the other outside. Neither has apparently seen me as yet, though my nearest approach to them has been about 50 feet. It is not possible to determine as yet at what point their activities are centering, if indeed, they have definitely determined upon a final location.

call A few minutes later one of them called using a series of short, staccato syllables sounding like kawk, kawk..... kawk, perhaps 8 or so in succession, all of about the same pitch, beginning with a crescendo followed by a diminuendo, thus:  This appears to be a contact call, and was heard here for the first time. It appears to be the one referred to by Dawson as kwoke.. etc. I am uncertain of the vowel.

Nova At 12 I went to the thrasher nest when both parents were away. Nova came at once, much annoyed and scripping and pecking pettishly at the leaves and twigs within 3 or 4 feet of me. B came within a few seconds and promptly and practically settled upon the nest, while Nova continued to move about almost within reach and still excited. Her scrip seems more of a whip than B's. As soon as I left she subsided. She seems absolutely unconvinced that there is anything to be gained by a less hostile attitude toward me and B's obvious material gain from his contacts with me are lost upon her entirely.

R. R. At 2 P.M. the road-runners had gone off to the west and I took the opportunity to look for the nest. There was nothing in Sta.1;

but about 20 feet from it in a Catalina Ironwood they had started a platform of twigs, immediately apparent to the eye.

Sta. 1 had no distant outlook and the support would have been unstable. Sta. 2 (in the ironwood) has a clear outlook in at least one direction and an open landing field; also there is good, firm support. From observations of Rhody it has been evident for a long time that he prefers perches, even, having an outlook over an open space. His preference for a night roost similarly located has been recorded. It would seem even more essential for a nest to be similarly placed.

At about 5:20 R was at the cage all by himself getting meat, also for himself. He was as tame as ever, coming to catch worms on the fly. He went to roost in his old place. Nothing further was seen of his mate.

I anticipate that he will have to find her again in the morning as B had to do with Nova every morning during the nest building period. There has been no singing since the two birds were first seen together, but I expect to hear it in the morning.

April 2nd.

Expectations were verified. R started calling about 6:15 A.M. and kept it up until about 10. I waited a short time, then approached the nest carefully. R was there working and boomed at me, but continued gathering twigs and placing them. His mate not seen.

Returning about noon, R was booming at one of his favored lookout posts at a turn in the road about 150 yards away. I went out to see if his mate was near. She was not. R was very tame, though running away (and returning) as each motor-car passed. He caught a lizard and, almost simultaneously, a loud : Koke, koke, koke : swelling and diminishing sounded, from the Robinson place behind me a hundred or so yards away. There was no doubt of the direction at all. R, again wagging his tail in a horizontal plane,

paused by me, hroooed softly twice, and proceeded toward the direction from which the call came, trotting slowly.

It is interesting to note here several points;

- just
- (1) R's difficulties in keeping his mate on the job, just as in the case of B and N (though not B and G).
 - (2) How the lizard-carrying episode fits in with his behavior before he got his mate, even to the tail wagging and refusal to eat it himself though hungry enough to take food offered.
 - (3) R, so far, the principal, perhaps only, nest builder. (The male)
 - (4) The female does call.
 - (5) The call is not ventriloquial. (Counter to Dawson).
 - (6) The vowel in this case was o. (Confirming " ").
 - (7) R was prompt in responding to the call, but not hurried.

About 2 P.M. Rhody was sitting quietly on his fragile platform doing nothing--just as the thrashers do. Also like the thrashers, little work was done in the afternoon.

About 5:15 R was at the cage for meat and a mock pursuit of the magpies, his mate not in evidence. He retired to his regular roost.

Mo again
returns.

The mocking-bird was not seen for several hours, but he finally returned to the cage about sunset.

Brownie keeps well posted on my movements, coming into the shop, and once discovering me a hundred yards or so out in the street as I was returning from the Reynolds'.

April 3rd.

Neither sight nor sound of either road-runner until shortly before 10 A.M. ^{*} (Rain during the night). I took this to mean that they were together somewhere, otherwise R would have been calling. About 9:50 the koke..... call (This time the vowel sounding like a short u) came from the Robinsons'. A few minutes later, a road-runner, startled by a motor-car, flushed from there landing near R's lookout at the turn of the road. (Selborne Drive). It was Rhody himself; demonstrated by walking up to him and holding a worm within an inch of his nose. He began a search, which I followed, for lizards, occasionally stopping and giving his soft

* See notes of Apr. 4

hroo, audible 25 feet (?) and looking off towards Robinsons'.

In the midst of this I though I heard a beak-rattle toward the east. No accompanying voice. R thought so too, and looked in that direction, but continued his headed for this place. As he did not call, I assumed that he knew all about where his wife was. He trotted up the driveway, entered the cage, got his meat, flirted with the magpies (who started desultory work on a nest yesterday), mirror danced and acted the clown generally. In the midst of this a loud koke.....call sounded from the east. R paused in his evolutions long enough to look in that direction and emit a succession of loud rattle-boos, but continued his fooling as if there were no other bird in the world. The koke call was now repeated nearer and nearer; R paid no attention for some time, but when it came from within the enclosure, he disappeared when my head was turned and I did not follow up as I wished to let them have an undisturbed interval. For a bird in love, I thought Rhody showed good strategy and self possession, and for him, doubt if the old saying: *Amare et sapere vix Deo conceditur*, is rigorously applicable. It was now 10:35.

At 11:45 Rhody's cooing song was heard far off to the north east. There is no certainty, of course, that Sta. 2 is to be the final selection of site. There is an enormous extent of contiguous territory equally, if not more, suitable for nesting purposes from the road-runner view point, with the possible exception of food and water supply. There are lizards all over the hills, some water, but probably no Hamburger beefsteak, and certainly not many human beings that will push meat and meal-worms into the faces of expectant road-runners.

Neither bird was seen to visit the nest during the day and Rhody was not in his accustomed roost at 5:45 P.M.

The mockingbird did not return to the cage for the night either.

April 4th.

Referring to yesterday's notes, both road-runners, very wet, were seen by G.K.D. at the entrance about 8:30 A.M.

Heavy rain again during the night.

12:15 P.M. Neither road-runner seen or heard here as yet today.

2:20 P.M. Dr. Reynolds and I looked all over his place and the Robinsons' but there were no roadrunners.

It has been recorded in these notes that the thrashers refuse sow-bugs and have been seen to take them away from their young ones and throw them away. Just now B was seen approaching the nest with food; when called he came over to me with a cut-worm and a large sow-bug which he had broken in two. He laid these down in order to get meal worms the better and when he again left for the nest, picked up the cut-worm but not the sow-bug. However, it was undoubtedly his original intention to give it to the nestlings.

7:10 P.M. Rhody is not in his regular roost and the mockingbird has not returned to the cage.

April 5th.

12:15 P.M. Road-runners and mockingbird are still away.

Rhody returns. 3:40 P.M. Julio says that, at about 2:30 P.M., Rhody, himself, came walking out of the mockingbird cage, ate meat, played with the mirror, etc. I found him just now at the Fish house, very willing to eat worms and meat and not looking at all embarrassed about his unexplained absence. Nothing was seen of his mate. As a rough guess, perhaps he was unable to induce her to come back with him, so gave up the job for the time being at least.

He went to his regular roost for the night.

During the last few days it has been noted that Brownie has become somewhat more articulate, and at the same time, the thrasher at Sampson's has been heard more often.

He has a nest now.

April 6th.

A calls. Rhody began calling about 8 A.M. from the old oak, but wandered away when the men came to spray the trees, returning later.

Young thrasher. One of the young thrashers squealed with fear when B appeared on the edge of the nest with a large angle worm.

First oriole. The first Bullock Oriole of the year is at this place.

B's attitude towards rain and umbrella. 4:30 P.M. Rhody has been sitting under the lemon tree for the last half hour, out of the rain, which has been falling since about noon. For the half hour or so preceding he was out in the middle of the oval lawn with the rain running off of his back. I took occasion to test his reaction toward me when carrying an umbrella by going to him and offering him worms. The umbrella did not seem to bother him in the least. His attitude toward the rain is peculiar. As previously noted, he does not always take cover from it. In the present instance, he actually spread his wings as if to allow it to wet his back intentionally. He does not appear to be wet, except superficially.

He not seen. His mate has not been seen today and there has been no nesting activity.

and umbrella. Brownie's reaction to the umbrella was also tested. It was the same as always noted previously; he is distinctly afraid of it. The thrashers are leaving the young birds uncovered for long periods of time now, but one or other of the parents seems to keep the nest tree in view most of the time from some vantage point.

April 7th.

Rain continues, at times, almost torrentially. Up to about 3 P.M., at which time I left, Rhody had been on the place all the time, resting and oiling himself under the various shelters (on the ground) provided for him. He permitted himself no vocal exercises other than a soft hroo or two in acknowledgement of the presence of

two of us. There were no signs of his mate, if she is a mate. Since she bewitched him and caused him to forget his home for two days, she has been christened: Circe.

All well with the thrashers.

April 8th.

Clearing (?) after a period of heavy rain.

Circe returns. About 10:30 A.M. Rhody, who had not been seen this morning, was heard booing off to the south east. Scrutiny disclose a road-runner sitting on his rock at the high curve of Selborne Drive. I collected dainties and proceeded in that direction, but to my **ood flight**. surprise, the bird launched itself into a splendid sailing flight against the wind, which was pretty strong from the west, dipped as it passed over the Fish house as if to land, but rose and continued off to the west, landing about 200 yards from the starting point. perhaps 50 feet lower, although some of the flight was upward. This did not seem like Rhody behavior, and , in fact it was not, for that bird was (after the flight) seen to be on top of the Fish house. He sailed down, ran rapidly toward me much to the satisfaction of my ego, until he veered off to the left toward another objective. This proved to be Circe who was headed for the lot adjoining this place to the west, although on account of the intervening houses neither Rhody nor I could see her until she emerged running across the street. R appears to have divined her course accurately while she was still out of his sight. I retreated, hoping that this might mean a resumption of nesting, as Rhody entered the brush at the point where Circe disappeared.

Rhody seems to be keeping his head pretty well after all and certainly exhibits more understanding of the psychology of female road-runners than I do!

At noon Rhody, all alone, was comfortably ensconced on a bed of needles from a hakea

on top of a wall near the apricot, enjoying the sun and at peace with the world. He either knew where Circe was or else did not care.

Circe approach- At 3 P.M. he was again reposing two or three yards from there, as we unawares. still at peace. As I was moving up to him to offer him worms, Circe suddenly appeared on the path beyond him, running toward us about 10 yards away, but as soon as she saw me, turned into the bushes. Rhody apparently did not see her and was unaware of her closeness, continuing to eat meat and worms, then subsiding for another rest, which he was still enjoying a half hour later when I left.

Neither bird has been seen at the nest today.

April 9th.

Young thrashers At 7:30 A.M. one of the young thrashers was sitting three feet from the nest, the other still in it. B gave them both huge "arm-fuls" of meal worms. The second one left the nest in a few minutes, but when I was watching Rhody nearby, returned, and B hovered him. (He left for good a few minutes later).

R.R. calls, The coke call sounded near, but I was unable to tell whether it came from R or C. R went to the top of the cage where he flirted with the magnies, hroced softly and several times repeated a new ^{horizontally} act. This consisted in stretching his neck out in a compound curve, opening his bill to the utmost, straining mightily and uttering a minute whine which I could just hear at 20 feet. After this he

R's new act. picked up a large twig and carried it to the top of an oak. I had to leave at this point to give the spray-man instructions about avoiding the nests and birds, but noted that R dived over the fence to the north east. C was undoubtedly in the vicinity, and the call probably came from her. This was the last seen of the road-runner for the day and he did not go to his accustomed roost for the night.

The young thrashers gradually separated, B taking charge of one and N the other. Eventually they arrived at the glade by devious routes and at different times, by running surprisingly

kip call well, though somewhat wobbly. Their yip or kip calls when hungry began only when they had left the nest. B began at once to chase intruders away from their immediate neighborhood, including jays, towhees and quail. One jay was persistent in approaching one youngster and B attacked him fearlessly (and silently) until it returned no more. This young bird screamed at one of the jay's advances. B demanded much food from me, so I gave him soft-food with which he fed the young.

I found I could trick him into feeding Nova's charge by going to that youngster and offering B food there; otherwise he concentrated his attention on the first one.

The kip call is extremely ventriloquial and it is interesting to note (as has been done before) that the parents are deceived by it just as are human beings. B was a frequent victim during the forenoon. There can be no doubt of the correctness of this observation.

When B has his especial charge well fed and therefore silenced for the time being, it is his custom to climb the old oak and sing detached phrases of song, in volume corresponding to about three-quarter song. It is clearly not intended for a distant auditor and seems to be designed to keep his family together and to inform them that he is present and on guard and will look out for them. While many of his typical phrases are used there is much that is of a "conversational" character. Perhaps this might ^{appropriately} be called his guard song.

April 10th.

Rhody not seen at this place during the day, although I was absent part of the time.

All well with the thrashers.

April 11th.

R not seen up to about 8:30 A.M. I was absent during the

remaining daylight hours. Julio says he did not see or hear him here. (See next day's notes.)

April 12th.

10:45 A.M. Rhody is now calling from the observatory tower. He was first heard here somewhat before 7 A.M. (10:47 he is on the roof overhead. I hear his voice coming out of the fireplace! Went out and looked; he is on the chimney).

R's hunt for his mate. He called here until about 8:30. Though I did not know it at the time, checking with the Reynolds shows he was there in their garden and on their roof calling about that time. Also that he was there and at the Covells' and Robinsons' yesterday.

About 9 I heard him off to the northeast and decided to follow him for a time, if I could find him. He was located (by sound) several hundred yards away in that direction, entirely out of sight of this place, wandering about the high, sloping western side of Dimond Canyon, calling. I kept in touch with him for an hour. Finally he swooped down part way into the canyon, turned in the air and rose to land in a low tree about a hundred yards away on the same side of the canyon. I went immediately to the tree, but could not see him. I then went to the Reynolds' and got the information quoted above. About 10:30 we heard him calling off in this direction, and he is now, 11:00, still on the chimney.

It is evident that he has lost contact with Circe and is endeavoring to reestablish it, so far, without success. Though friendly enough, he is not interested in offers of food. I could not fool him with attempted imitations of the coke call.

12:10 P.M. When R left the roof he went to the cage for meat, a ten minute's bout with the mirror, followed by a calling period from the top of the old oak. Thence to the roof of the Scamell house to continue his calling while looking off over the country.

1935

He is still calling.

climbs up
vertical
wall.

Mrs. Scamell says that, yesterday, he went straight up the corner of their house and perched at a second story window. (Actually, at that point, a third story window). This house has quoins at the corners.

repeats
lizard tac-
tics.

2:25 P.M. Rhody is now on top of the roof again. He called from the Scamell roof until 12:40, then caught a lizard and carried it about until about 1:30, finally eating it himself, since he could find no takers. The intervening time has been occupied in mirror dancing, preening, calling, sunning himself in an entirely new pose (fortunately caught with the movie camera) and hunting for lizards.

^{long} In this he has shifted from place to place, mostly inside the fence.

in sunning
pose.

In his new sunning pose he extends his wings to their utmost and lies down, lowering his head.

7 hour watch. I have been watching him closely today especially in order to get some information on the extent of his roving. So far his movements since 7 A.M. have been accounted for practically in their entirety. I.e. over a period of 7 1/2 hours. During this time the farthest he has been from here has been about a quarter of a mile.

He was not watched during the rest of the day.

Not at old roost. He did not occupy his old night roost.

2:25 P.M.

calls early. Rhody was heard calling near the house at 5:55 A.M. This is the earliest yet and may mean that his new roosting place is even nearer than before, and also seems to confirm the continued absence of Circe.

At 9:30 he was playing with the mirror; I thought he would be off looking for his mate.

It should have been recorded yesterday that B is beginning to pick up twigs again and that he explored a branch of an oak at the oval lawn just where I had hoped they would build some time,

as it is an ideal place for them and, incidentally for me.

Rhody hung around all the time up to 1:15 P.M., at which time I left for the day.

April 14th.

R was heard calling early off to the east.

B ditto, here, at 5:15 A.M. (B.M.)

9 A.M. Well, B has "up and did it". He just got worms for one of the youngsters, then gathered a good billful of small twigs and took them directly and without hesitation to the ideal place noted above, where he already has a presentable platform started. The first brood of the year has only been out of the nest 5 days and are, of course, still being fed by both parents.

Circe and R
here while I
searched else-
where.

10:05. After a long search for Rhody off to the north east, without success, I returned to find both him and the "departed" here
Circe, at my own place! Circe did not stay long, however, and Rhody climbed the observatory tower to get a wide view and to call (with rattle-boos exclusively). Circe answered off to the east with the same sound, then to the south. At about 10:15 I saw Rhody sitting on his rock at the high curve of this street and went out to him.

Trailing Circe

R greeted me with mutterings. (Soft rattlings of the beak without vocal sound). He continued this mixed with soft hroos, looking toward the north east.

Circe called from that direction: kuk,kuk,kuk-----kuk-kuk.

R sauntered slowly toward the sound, which was not uttered again during the following action, muttering and hrooing softly, always looking in a general north easterly direction, intent upon his objective, but not failing to note butterflies, etc. He was in no hurry. He appeared to get some clue (which was lost on me), turned and trotted due east by my feet and went up into Robinson's. There he followed along the top of the stone retaining wall in a northerly direction, neatly catching a lizard en route which he carried with him, doubtless as a present for his intended bride. I followed on a parallel course in the street until I was pretty certain of being able to intercept his route when he emerged from the Robinsons', and then took a round-about course to wait for him near the Robinson north fence.

This worked out satisfactorily and he was soon seen still inside the fence working east.

10:40

He arrived at the Robinson north east corner at 10:40 and

there climbed up 20 feet in and oak on the edge of the 20 foot bluff bounding the property on the east along Park Boulevard in Dimond Canyon.

- 10:53 At 10:53, R still in the tree with the lizard, Circe called, using the coo, coo, etc. song for the first time heard here. It came from the east and was faint. R paid no attention to it.
- 10:55 Circe suddenly landed in front of me 50 feet down the slope, coming from "nowhere". R hrooded softly and sailed down to her, both vanishing into the chaparral outside the fence, going north.
- 11:00 Rhody emerged from the northern edge of the chaparral still carrying the lizard, in the open to the next patch of brush. C was not seen, though she had undoubtedly preceded him.
- 11:02 R went up into the same dead baccharis bush where he was located on the 12th. and from which he commands a wide view, hrooping softly.
- 11:03 He comes down, goes to the edge of the brush, bows his head, hrooes softly, wags his tail rapidly back and forth sideways, then goes in. An Anna hummer watches him closely.
- 11:06 He comes out the other side (northern) 100 feet away, wagging tail and hrooping and trotting toward a clump of oaks, with lizard.
- 11:07. Skirts the chaparral, climbs an oak. He and Circe are together in the tree by the time I get there and the lizard is gone. I walk up in the open to within 20 feet of Circe, who is in plain sight without even a leaf between us. She does not seem disturbed in the least; neither does R.
- 11:10 Circe preens, disregarding my presence; she looks just like R. R does exactly nothing.
- 11:11 Circe drops to the ground and walks slowly into the dense growth, to the east about 50 feet, on the edge of the bluff, here about 30 or 40 (?) feet high and substantially perpendicular. The edge of this bluff is constantly breaking off and carrying the trees and brush which grow on the edge down into the street.
- 11:14 I approach R within 10 feet. He hrooes softly. I wait, thinking that if there is a nest, he will show me where it is if I remain still.
- 11:18 R "rattleboos" loudly, follows course taken by C. I wait several minutes, then enter the almost impenetrable thicket of baccharis, sage, mimulus and poison oak from the north, as near the edge of the bluff as seems safe, in view of its caving habit.† When I think I am near where the birds "ought" to be I wait.
- 11:28 R hrooes, apparently about 10 or 12 feet from me, south, on the edge of the bank. The brush is too thick to see anything inside its margin. I come out, reenter west side and approach edge of bluff, stopping when I think R is probably within ten feet or so.
- 11:37 R hrooes softly; I seem almost on top of him, but can see nothing. By sighting along the ground under the bushes I at last see him lying down comfortably in the sun looking over the edge of the bluff down into the canyon. If I had a stick I could poke him with it. He pays no attention to me at all. There are good nesting places all about, but no signs of a nest. (Except a bush-tit's overhead). By going back and around again to the point from which I entered at the north, I can approach him nearer and determine whether the mass of dead twigs on which he is lying is a nest or not. I do this, making plenty of noise, but not disturbing him.
- 11:45 When I get as close to him as I dare (on account of the soft edge) I toss him a worm which he catches expertly and forgets all about Circe (who is not to be seen). I toss more worms where he will have to stand up if he wants to catch them on the fly. This works: it is not a nest. When I retreat, he follows me out like a lamb and sits on a limb 5 or 6 feet off, hoping for more worms; but they are all gone. He resumes his watch over the canyon as I leave.

+ Feb. 15th, 1936. This place has just slid down, trees and all.

He had travelled about 600 yards from the tower and was 946
about 400 yards due N.E. of it.

R.R. nest (?) No work has been done on the nest that was started here since the second day. After watching the birds today, I think also that there is no other nest and they are still in the courting period with no fixed determination of the immediate future's having been reached. While I did not actually see Rhody give Circe the lizard, circumstantial evidence that he did is strong enough to be convincing. It also appears that he is none too certain of her at times, yet, on the other hand (as when he waited in the tree) he seems to know just how to handle her.

Rain. A warm rain began to fall about noon.

R comes home for shelter. About 3 P.M. Rhody returned to sit under one of the shelters provided for him, where he remained a long time. He had gone at 5:15 and was not in his old sleeping place as late as 5:30. at which time it was still raining.

Young thrashers try to dig. About 5:45 Brownie was given all the worms that he wanted for the young thrashers. The latter now try to dig for food, but are not very successful and do not recognise food as such.

April 15th.

Rhody's Anniversary Today is the anniversary of Rhody's first appearance at this place. He celebrated by opening the day with song. Raining.

R finds time to play. At 9 he was at the magpie cage pretending to try and catch the inmates, running up the sides and on the roof, flirting with the mirror and making theatrical poses. A sudden shower came up and he bolted directly for the shelter placed for him at the base of the old oak. He is learning the proper use of the appliances of civilization.

B deceived by ventriloquist's. B came to me at the oval lawn for assistance in feeding the family, one of whom could be heard kipping, as I thought, about 30 feet to the south west. B did not think so and searched the shrubbery to the south east, returning with the worms ^{still} in his bill, then going up into his new nest with them, and of course, finding

nothing there. (An unreasoning association of nests with the feeding impulse(?)). He finally found the youngster and, it happened that I was exactly right. It was quite dry after all this rain. "We" gave him a good stuffing.

speculation. Is it by accident or by design that nature has provided these young thrashers with a call that makes it difficult to find them? Possibly it is intended to furnish some measure of protection from enemies while enabling the parents still to keep in touch with them. If so, it seems to have been overdone, since the parents are often misled, as has been repeatedly demonstrated here.

B's "feeding talk". On this occasion, both when Brownie was at a loss and when he ^{also} had located his offspring, he kept repeating the "bluebird" call, and quilk, queelick (somewhat blurred) and a modified scrip. These were used also when returning to me. ^{bluebird} each time after delivering his cargo.

R on search. About 10:30 R was heard calling off to the east; evidently on another of his Circe-finding ventures. About a half hour later his song was heard nearer, once.

Sta. 3. About 11:30, when in search of a jay that was annoying the young thrashers, Rhody was found in an oak 30 feet west of the western fence, unexpectedly. This is about 75 feet from Sta. 2, and has been suspected of being R's present night roosting place; also, due to his interest in it during the past few days, it has been considered a potential nest site, though I have not examined it ^{from the inside} to determine if it appears to meet requirements for proper support.

Call it Sta. 3. (Note: Sta. 2, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000)

About 4 P.M. I examined Sta. 3, Rhody not being around. At what looks like the best location in the tree there is a collection of twigs which may be the beginning of a road-runner nest.

April 16th.

About 8:30 A.M. I went to the west fence and watched the tree

busy at
Sta. 3.

for evidences of nesting activity. R had not been heard singing and it was thought that he might be busy building. In less than one minute he came down from what appeared to be the exact spot and returned to it a few seconds later. Due to intervening branches and his quick, business-like movements, I was unable to see if he carried anything. After this observation nothing was seen or heard of him or his mate during the rest of the day, although I explored the territory about 400 yards to the N.E., which is now much favored by them, and has innumerable superior nesting sites.

Nest 11.

Brownie occasionally added a wisp or two of soap-root lining; Nova did not help at all; in fact has not been seen to work on it at any time. Both took good care of the young ones, who are now digging quite energetically.

April 17th.

At 7:50 Rhody was not at Sta. 3, nor had he been heard.

At 8:50, ditto.

Nova helps
line nest.

At this time Nova and Brownie were gathering soap-root fibre in large bundles for the nest and still attending to their brood. This is the stage of nest building where the female helps most: in fact, in the case of Nova, it may be the only time; furthermore, she may not help at all.

Thrashers'
songs.

Brownie continues to sing at intervals throughout the day, whereas Nova, aside from occasional scripping, is practically dumb. She has not been heard in full song more than once or twice this season.

Thrashers mate
for more than
one season.

It is clear that, at this place at least, thrashers remain mated for more than one season. Both Greenie and Nova (with B) exemplify this.

April 18th. to 20th. incl.

Nothing has been seen of Rhody at this place, but about noon

road-runners
at Oakmore
Highlands.

of the 20th., Mr. Austin and Mr. Bennett called to see if I could identify two strange birds that they had seen 10 minutes before across Dimond Canyon on top of the highest hill of Oakmore Highlands. From their description it was evident that they were roadrunners, presumably Rhody and his mate. They were stated to be "tame".

Couldn't find 'em.

Search in that vicinity, which is being laid out in streets and is full of men and road machinery at work, and carpenters building houses, later in the afternoon failed to disclose either bird.

Young thrasher
drowned.

Mr. Sampson called a few minutes earlier and discovered one of the young thrashers drowned in the lily pool. A strange dog had been here earlier in the morning, torn up the thrasher feeding stand at the oval lawn, dragged it about, and may have chased the young bird into the pool. The other youngster was safe.

April 21st.

Unable find R at
Oakmore.

Another search for Rhody et al, without results, was made at Oakmore Highlands.

Rhody returns, At noon, as I approached the magpie cage to note progress on
tame as ever.

their nest, I was surprised to see Rhody playing with the mirror. I got some meat for him and he met me part way, taking the meat from my hand hungrily, bolting it at once. This is the first seen of him at this place since the morning of the 16th., the longest absence since he adopted this place as headquarters--5 days. He was not seen here again during the rest of the day.

April 22nd.

R back for break-
fast.

Rhody was back at breakfast time, rattle-booming and accepting meat offered him.

Circe calls.

At 9:15 the koke call was heard from the east and an answering rattle-boo from Rhody, now on the roof. A few minutes later he

he was in the driveway and ran quickly up to me from a distance of
 answers. 150 feet, boomed, made a semicircle around me and climbed the old
 oak to call toward the east, using the boo call only. I sat quiet-
 ly to note results. About 9:30 Circe came from the west, but Rhody
 did not see her and continued his calling. C saw me almost at once
 (25 feet away)
 and stepped into the bushes. A few minutes later R saw her and dived
 down to her and I left them undisturbed, somewhere out of sight.

R loses C About 10:30 R began booming again from the top of the Scamell
 goes to hunt house, worked off to the south west, boomed from various trees and
 was last seen about 250 yards away, where he was frightened from
 the street by a passing delivery truck, causing me to lose the trail.
 back again I suppose he was looking for Circe, who (11:40: There's old Rhody
 just outside the window in the act of flying up to the roof..He's up;
 begins booming!) Going back to Circe: She steals about like a ghost
 and Rhody, himself, seems to have as hard a time keeping in touch
 with her as I have. 11:50. He is now on top of the living-room
 chimney scanning the country in all directions. He is getting plenty
 of exercise these days.

R gives lizard On one of Brownie's return trips from feeding the surviving
 to youngster. young thrasher, he spied a small lizard, about 3 inches long, which
 he promptly subdued after it had escaped his clutches two or three
 times, losing its tail in the meantime. The tail Brownie ate him-
 self, but the rest of the animal in its entirety was given to the
 young bird, who swallowed it without any trouble and immediately
 was ready for more food, for which B came to me, after examining care-
 fully the exact spot where he had caught the lizard.

April 23rd.

R here. Rhody was here at breakfast time drying himself after a short,
 unexpected shower.

9 A.M. There has been a thrasher in the nest each time it has
 been visited this morning. Just now it was Nova, but as I watched,

B came, sat on the edge and they "talked" in silent pantomime. This nest is about 7 feet from the ground. On showing B the worm box, he immediately dropped down to my hand, ate worms, returned to the rim of the nest without taking any to his mate or considering, apparently, the youngster somewhere off in the bushes.

Incubating shifts 2:30 P.M. The thrashers are maintaining regular shifts and probably have at least one egg. They attend to the young bird as usual.

The latter is beginning to follow Brownie to me.

Band C away. Nothing further seen or heard of B or C during the day.

April 24th. and 25th.

R here early on the 24th. but not seen or heard again during this period.

Continuous incubation. Thrashers incubating continuously and ^{the "off bird"} attending to the young one.

April 26th.

No Rhody. Up to 10 A.M. no Rhody.

Young thrasher taming himself. The young thrasher now takes [^]worms tossed to him whenever Brownie does not see it first and insist on getting it for him.

Cat alarm. B's reaction. At 9:30 A.M. B and the youngster were with me near the old oak, B giving the latter a mixture of scalded soft food and ant "eggs". Suddenly B flattened himself with bill tail and back parallel to the ground, stared fixedly past me and uttered a succession of very soft, interrogative queelicks, queelks, wheels, etc. I could see nothing behind me, even when I stood up. B then climbed the old oak rapidly, still talking, and looked off to the north, gradually turning his head toward the east. Search revealed the cause of his anxiety as a very handsome Persian cat in the long grass of the open field. As long as this animal remained in sight from B's post, B watched intently, a matter of perhaps 15 minutes.

B sings, Nova answers from nest. B then began to sing and was answered by Nova from the nest at the oval lawn in her unique high-pitched voice--like that of no other

thrasher I have ever heard.

Discover Rhody
at my feet.

At 1:10 P.M., as I stood looking at the magpies' nesting operation, I was startled by an indistinct mass in motion at my very feet. It resolved itself into Rhody, calm and collected and offer-

Very hungry.

ing no explanation of his long absence. I fancied that he looked hollow in front where he ought to bulge, so got a piece of meat which he unhesitatingly took from my fingers with (perhaps invol-

Keep in con-
tact with him
3½ hours.

untary) ooks as he reached for it. I have been looking for an opportunity to trail him again when he leaves the place in order to see if he has a nest somewhere; consequently I concentrated on

Learn nothing.

him exclusively, following all of his wanderings for three and one half hours, when, as I shifted position in order to get a clearer

He "evapor-
ates" totally.

view of his anticipated next move, I lost sight of the spot where he was sitting quietly only about 30 feet away, for perhaps 10 seconds, and when I looked again, he had vanished utterly without a sound. Two of us then searched for another hour, looking, I think, in every place where he has ever been seen within the property lines and at the Scamells', but there was no trace of him. In addition his usual avenues of approach and retreat, to and from this place were scrutinized from ⁿpoits of vantage to no avail.

During the 3½ hour period he went outside the fence only once, (for about 10 minutes at the Scamells') being disturbed by the close proximity of a visitor here, and returning when frightened by a car on the street. He was not obviously disturbed by my persistent trailing. He had several helpings of meat--he was hungry, caught a bee or two and a painted lady butterfly and other things undetermined. This period was mostly a loafing one, manifestly a time of relaxation. While he did mount to the roof twice and look off over the country, he did not appear to search for anything did not call and only boomed two or three times apropos of nothing evident. Altogether, I should say, he was not in motion more than

10 minutes of the $3\frac{1}{2}$ hour period, perhaps even less, and did not average more than about 2 miles per hour. ^{when in actual motion.} (This works out at a distance covered of about 600 yards, which checks up fairly well). It is clear, therefore, that he had a pretty good loaf. He preened in one spot (in the old oak) for 45 minutes, rested in the shade in another 20 minutes (temp. about 80) and at innumerable other points for shorter periods of time. In fact; resting was his strong point and at no time did he appear to be concerned about family affairs.

Road-runner
drinking habit.

Dawson says: "Captivity reveals the fact that the bird is not closely dependent upon water. It will drink only at intervals of three or four days; but when it does indulge, it drinks copiously, -- fills up as for a long sojourn in a distant desert".

R drinks fairly
often.

During the $3\frac{1}{2}$ hours Rhody drank five times, i.e. on five different occasions, and at five different places he drank freely. Of course he may not have had a drink for several days preceding, but this seems unlikely, since at the present time there is abundant water in the hills, and while "in jail" here last year ^{he} drank frequently, i.e. certainly at least once a day. Also, after he visits the cage for meat, more often than not he follows up with a good drink. Without pretending to scientific accuracy, he drinks as often as the magpies and the thrashers. Under desert conditions it is reasonable to suppose that the road-runner often goes for considerable periods of time without water--he has to; but where water is available, I am inclined to think that he indulges about as other birds under similar conditions.

April 27th.

Rhody not seen here today.

April 28th.

Rhody was heard to boo here about 10 A.M. He spent a half hour or so on the roof--not calling. When he came down he accepted worms from hand gratefully. He also drank. He did not go to the cage, but wandered off to the S.E. slowly. I followed.

R drinks.

Stalking Rhody.

At 10:45 he discovered a two foot snake by the sidewalk. He merely looked at it curiously as it glided away under a bush. He followed and came out the other side without attacking the snake. This is evidence to support the theory that road-runners attack voluntarily only those creatures that can be swallowed whole. *(Except for the snake)*

R turned to the N.E., across the lot and to estates drive, apparently working toward the territory to which he has been followed before. However an approaching motor caused him to take fright, reverse his course and fly to the S.E. A search of 15 minutes failed to locate him. During this I covered the ground where the snake was, and that animal, presumably the same one: a yellow-bellied racer, introduced himself to me by taking a turn or two about my ankles when I nearly stepped on him.

I returned here to see if R had sought refuge here--no results. Decided to see if I could find him in the "N.E.Territory". Found him looking very innocent 40 feet N. of the Robinson fence. He did not even stir when I burst through the bushes upon him and , when offered meat, came tamely and took it from hand, then sat near me for 15 minutes looking off over the canyon to the east.

At the end of that time he dived into the thick undergrowth (mostly poison oak) below him. 20 minute search disclosed nothing but a California jay's nest containing four eggs. Every sound heard in the bushes was made by a smaller bird. R is absolutely noiseless in motion. Even song sparrows make more sound in motion.

A commanding position failed to reveal R's further course. It was assumed that he probably had gone north across the open to the clump of oaks where he and Circe were found a few days ago.

Accordingly I proceeded thence. In the first tree a road-runner was found sitting in an elementary nest. I waited 15 feet from it. The bird came down without fear, picked up a twig 10 feet from me

carried it to the nest and placed it carefully. Rhody, of course. I left him at about 12:30 still working. Nothing was seen of
 Sta. 4. Circe. This is now Sta. 4 and the third nest on which he has been seen to work. (????????). Distance from here as the crow flies: about ⁵⁰⁰~~440~~ yards; almost exactly N.E., on SW side of Dimond Canyon. A secluded spot but unfortunately without protection from prowling youngsters looking for nests or something to kill, and vacation time approaching!

comes home. At about 4:15 I was in the magpie cage watching the nesting operations of those birds. Rhody stalked in to the outer compartment and gobbled his Hamburger beef, then went outside to sit under the trees as if for a long stay. He was not observed further owing to unexpected actions of the magpies and an impending engagement of my own elsewhere for the rest of the day.

Magpies. By observing the act of copulation yesterday, the smaller bird, "Kack", as has been suspected from the first, is now identified as a female and the larger, "Oof", as the male. Copulation is a noisy operation.

A Puzzling Incident.

About 4:30, I in the cage, Oof carrying a cashew nut about, Kack looking at the nest and occasionally touching it with her bill gently; everything quiet, Rhody "resting" outside:

Kack moved to a perch and displayed, seeming to invite Oof's attention; he alighted beside her and raised both wings. She seemed seized with vertigo, fell over backward and hung from the perch by one foot, tried to recover, lost her grip, but hung on by her chin, fluttering wildly, without vocal sound, nictitating membrane oscillating. She fell to the ground, wings useless, lay gasping on her belly, wings extended, tail spread, seeming to be in a fit. Oof dropped down to her and fanned above her with his wings, standing to one side. Kack tried to get up and fly, but could not.

She managed to climb up a few inches to the mud-sill on which the frame work of the cage is mounted and to which the wire mesh is stapled, holding on by thrusting her bill through the hexagonal mesh. She fell off, recovered, tried to fly to the perch; could not; climbed the wire by inserting bill through mesh as aid, making plaintive sounds and fluttering. When she reached level of perch and was displayed flat against the wire, Oof tried to mount her but was shaken off and she fell to earth and seemed to be dying. She recovered partially, re-climbed the wire and got on the perch, swaying dizzily, ~~and~~ appearing bewildered and stupid, nict. membs. closed for long periods of time. She swayed and fell off, landing on her back in the top of a bush; was unable to right herself and slid off; Oof much excited and noisy but not bothering her. Again she climbed the wire to the height of the perch, but was unable to transfer to it and clung there motionless. I took her off the wire without resistance and held her in my hands; she lay quiet and seemed to enjoy the warmth. Oof, however, did not like this and screamed loudly the moment I picked her up. I put her in the nest; she screamed and flew to a perch. Oof was frightfully angry at me, followed me about, yelling at me twice as loud as before and seemed to contemplate attacking me, concentrating his attention on me alone, while Kack swayed on the perch turning her head slowly with eyes open but dull, by all appearances a bewildered and moribund bird. I had to leave, but returned in about three quarters of an hour with Dr. Reynolds, to whom I had described the action. She appeared to be normal, moving about freely.

April 29th.

Maggies.

About 9 A.M. everything appeared normal in the magpie cage and more work had been done on the nest since above incident.

Rhody home.

Rhody was home again and inspected the magpies judicially.

B and young.

B came to me followed by his satellite who still uses ^{his hand of} the

fairy chorus when grub is in prospect and much prefers to have it pushed down his gullet by B rather than to dig for it himself. He can fly like a professional and his digging technique is perfect in appearance, though I doubt whether it is very effective. He knows that human beings are in some way to be associated with food and is ready to do his part in a taming process, but he is doomed to be chased away by his parents. B has, once or twice, shown some impatience with him and exacts commission on food supplies now passing through his "hands," instead of delivering them intact.

Cat after young- At about noon, as I passed the glade, the Persian cat (See **ster?** notes Apr.26) ran out and fled. Returning to the glade, I found the little thrasher there, out in the open on the ground. He must have had a narrow escape. He was immediately interested and, although B was not with him to set the example, ran directly to me to pick up all worms tossed to him. (Intermittent rain).

R drinking again. At about 3 P.M. Rhody was noted drinking at the glade, though this is anything but a thirsty day. He wanted neither meat nor worms and sat on the ground gloomily looking like a large, ragged pine cone, pretending not to see me 6 feet away. I got a live mouse, reserved for his special benefit, released it near him. It ran off at high speed. Rhody immediately became a sleek, much interested bird and chased it for forty feet where it took refuge in a crack in a loose wall of stone. **Mouse commits suicide.** R planted himself facing the wall, looking bored again. **This sounds like a lie!** Soon the mouse jumped out of the wall straight through the air toward Rhody, and into R's mouth. R did not have to move his head at all! R killed the mouse (as I thought) and began his standard tactics with living prey, walking about with a ^{side} glance now and then at the victim. However, this time, he was too careless and the mouse darted under the trees where R was unable to find him again, abandoning the search to sun his back and think things over.

R over confident.

April 30th.

Rhody calls me
early.

At 5:35 A.M. a tap on my bedroom window and two or three boos attracted my attention to Rhody sitting on the sill and observing the interior with interest. He had reached this point from the living room roof just below. I got up and opened the window and he went around the corner, tapped a south window once and boomed two or three times. I could not open the casement without sweeping him off into space, so was unable to determine his intentions definitely. However, from the fact that he did no mirror dancing, tapping only once on each window, I judge that he wanted to come in and the tap was to determine whether the way was unobstructed. The boo seemed to be some form of comment based either upon his unexpected discovery of me or of disgust at finding his plans thwarted. Perhaps his plan was to "call me early" to be Queen of the May. If so, his calendar has skipped a day.

Active nest-
ing at Sta. 4.

At 10:00 A.M. I had gone quietly to about 75 feet from Sta. 4; this is the first time since the nest was first located. A road-runner was carrying twigs up to it and had not apparently seen me. I left at once to avoid possibility of disturbing the bird. I do not know which one it was.

Oof disposes of
first magpie egg.

At 10:30 A.M. Julio announced that the magpies had an egg and that Oof was carrying it about! I got there in time to verify the observation and was weakminded enough to leave in order to answer a telephone call. (all telephones!). When I returned there was no sign of the egg anywhere within the cage, although I searched everywhere, including the nest. Not even a fragment of any kind. or possibly buried it. I suppose Oof swallowed it whole, I do not know whether he got it from the nest (which is still unlined) or from the ground. There was no egg in the nest a half hour or so before.

Rhody home again.

About 4:30 I looked for Rhody here, thinking he should have knocked off work and returned for food, drink and rest. He was

found sitting on a garden bench sunning himself and going over his feathers carefully. When everything was arranged to his satisfaction he started to follow his old route to his former night roost, but when he reached the middle of the street, stood there for several minutes thinking it over. This process resulted in his deciding upon the lot to the west of this house, where he disappeared in the brush. I watched the tree in which Sta. 3 is located for 15 minutes or so, but he did not go there during that time. He had eaten the meat in the cage.

May 1st.

absent.

R not seen up to 1:20 P.M. and his meat untouched.

magpie

There were no magpie eggs in the nest at about 9 A.M. Oof was "shooed" into the adjoining compartment and the door closed. No eggs up to 1:20.

Rhody at nest.

At 1:45 I sat about 100 feet from Sta. 4. Soon a road-runner was seen going up to it. It came down, stood under it a few minutes, then went back. I approached carefully and saw it sitting on a branch below the nest, not looking at me. It was hard to see. At this time of year these scrub live oaks have on their limbs patches --mere films-- of dull greenish "moss" (An alga (?)).

atches
ark.

Parallel streaks of light gray fungus--also mere films--run through them. This is essentially Rhody's color scheme and he blends into it perfectly. Also it is fairly dark inside these trees, which are almost hollow hemispheres covered by a dense canopy of leaves supported by a complex of bare branches like irregularly disposed ribs of a giant umbrella. I went under the tree, losing sight of the bird. I ascended a foot or two into its multiple crotches and saw the bird about ten feet away. He had not moved from his original location apparently. I say he because the moment I showed him a

comes for
eat.

piece of meat, he came promptly across the intervening space, jumping from branch to branch, and gulped it from my finger tips hungrily,

so naturally it was Rhody. Nothing was seen of his mate.

The nest has grown materially and, at present, it looks like a serious effort.

May 2nd. 1912.

10:30 A.M. Rhody not seen or heard here this morning, but this does not necessarily mean that he has not been here.

Young thrasher takes worms from hand. The young thrasher, in the absence of Brownie at the nest, came to me of his own accord and took worms from hand for the first time. He has been out of the nest now 23 days. He begins to look more slender.

Shadow boxing. A little later B came and stuffed the youngster well with soft food and gave him a lesson in shadow boxing in which the parent allowed himself to be defeated and driven from the field. This is all true to form.

No magpie eggs. No magpie eggs. In this case Oof could not have run off with it even if there had been one, since he has been separated from his mate.

He returns and goes afternoon off. About 1 P.M. I took a turn about the place to see if Rhody had returned. He had and was resting. It soon appeared that this was to be his afternoon off, as he did not leave the place until 5:30, going into the lot to the west where I followed him until 6:10 without discovering his final destination for the day on account of the dense growth which handicapped my progress, but not his. He did not seem to mind my trailing him. Several times when I had lost him he came placidly out of the thicket to loiter about me for a few minutes, then to return. His course could be approximated roughly by the scolding of the wren-tits, bush tits and plain titmice and spotted towhees, who do not like him. This thicket is made up of scrub live oak, baccharis, mimulus (diplacus), sage, hazel, cascara, soap-root, gooseberry, blackberry, poison oak (my chief obstacle), etc.

While inside the fence he did all his usual things, including a long bout with the mirror and three trips to the cage for meat and a prow on the roof. On one of these I went upstairs to see what he was doing and he came to the window where I stood and hammered the glass hard about 6 inches from my belt buckle.

Not calling. During all of this 5 hour period he did not call his mate once and booped on only one occasion, the purpose seeming to be to announce his view from his immediate intention of flying up to the roof. On the roof he simply gazed at the scenery as if enjoying it. From that point ^{view} he commands an uninterrupted from north to south, through west, of hundreds of square miles of land- and seascape, including nearly all of San Francisco Bay, and the principal cities (except Berkeley) of the Bay region. (A part of Berkeley is visible)

Song. Brownie is singing full song early in the morning, but little during the day. There is no sub-song at all, and Nova continues almost complete silence.

The road-runners' nest was not visited today.

May 3rd.

Progress on roadrunner nest. Rhody was not at the nest at 11:15 A.M. and was not seen here, but he seems to have taken the meat from the cage early in the morning and again late in the afternoon. The nest from the outside looks well advanced. I did not look inside. It is about 12 feet from the ground. Took photos of the general vicinity.

Photos. At 7:15 P.M., when it was fairly dark, I heard the young thrasher calling. He was on the driveway and came running to me as soon as he saw me and took worms from hand. At that particular place there has been for several weeks, beginning about sunset, a whirling swarm of flies(?) in a mass about one or two feet thick and about 6 or 8 feet in diameter. They disappear at about this time. The youngster saw them and hesitated about running through them at first, but finally did, not trying to catch any of them

May 4th.

Absent.

Road-runner not seen all day, and he was not at the nest about 10:30 A.M. The meat was not taken from the cage.

The young thrasher is "taming himself", getting quite interested in human beings and does not mind visitors especially.

At about 7:05 P.M. Brownie called from the nest and came to me without watching to see if his mate would take charge. (Sunset 7:02), I took advantage of the opportunity to ascertain that the nest contains three eggs, the usual set here. Nova arrived shortly--perhaps she was there waiting for me to get away. I needed a flashlight to see her, as there is a ^{rather} very short twilight in this latitude.

3 eggs.

B ignores milling I induced B to come to where the flies were milling around in flies.

their favorite spot, but he would not even look at them. The young-

B takes mosquito off my hand on request.

ster ignored them also. Brownie fed him and before leaving to lead the way to roost, Brownie, on invitation, picked a mosquito neatly off the back of my hand. He did not eat it, but threw it away with a flick.

B led the way through the branches of the oaks, the young one following closely, to the acacia tree that he favored occasionally in the past on warm nights. (Present temp. 70--meeting this speci-

B and young roost in same tree.

fication). When last seen about 7:20 they were roosting not more than 2 or 3 apart in the same tree, affording the first instance noted at this place of an adult and a young bird roosting in the

N takes night shift.

same tree. Incidentally it will be noted that Nova took the night shift, which I have suspected her of doing with the present nest.

May 5th.

Circe visits the cage.

At 9 A.M., on approaching the magpie cage, Circe was seen in the outer compartment, fluttering rather wildly when she caught sight of us, showing that the bird was not Rhody. In a half minute or so, Rhody appeared and watched her from the outside without offering to help her out of the dilemma. We moved back to allay

her fears and she finally came out, joined Rhody and both went off slowly to the east and disappeared. Of course, it is not certain that the bird was Circe; it might have been still another one.

Dr. R reports
road-runner song
from Dimond
Canyon.

Dr Reynolds came over about 9:40 and reported a long series of road-runner coos in Dimond Canyon which may have been due to Rhody (or to some other bird), but, due to our not having recorded times exactly, it was impossible to tell which. However, Rhody has not been heard to give his cooing call by me for some weeks. I have been under the impression that he had reached a firm basis of understanding with his mate that made such calling unnecessary.

Mrs. more
common here than
thought?

I am beginning to think that roadrunners are more common here now than has been generally supposed.

Later I went over to the Reynolds house which overlooks Dimond canyon but could hear nothing of roadrunners. Watching Sta. 4 from a distance failed to reveal either bird.

Young thrasher
sounds off.

The young thrasher has now begun to practice his song.

May 6th. and 7th.

Rhody "scarce".

Neither road-runner seen or heard. On the 7th. the nest was watched for about a half hour without either bird being seen. Meat was taken from the cage on the 6th. but not on the 7th.

Young thrasher
able to support
himself, but
B feeds.

The young thrasher is thoroughly able to take care of himself, but B continues to feed him.

May 8th.

Kack steals her
own egg.

At 9 A.M. Kack was on the nest. A short time later Julio reported that she was moving about the cage with an egg in her bill but dropped it.

B feeds Nova
on nest.

About 10 B got meal-worms from me, looked for his off-spring, could not find him, so went to the nest. (While I have not checked up accurately on this nest, I expected at least one chick today). Nova begged him for food, clucking, and he gave her one worm at

a time, each of which she ate, then left. B examined the contents of the nest, probing with his bill, then took charge.

I have forgotten what previous records show and wish to get direct evidence on whether these birds feed two broods at the same time.

R absent. Nothing seen of Rhody to day and I did not visit the nest.

May 9th.

Rhody here. 4:10 P.M. Rhody is here now, having (according to Julio) been chased back home by two dogs after having visited the cage for meat and gone off up the street.

One chick in thrasher nest. On change of shift at the thrasher nest, B going on without taking food, I glimpsed one egg and one chick. From my position it looked as if the third egg had disappeared. This seems to be the usual thing with Nova's nests.

May 10th.

Two chicks; There are now two chicks in the thrasher nest and no eggs. (Noon). Hence, as usual, with Nova's broods, there is a disappearance of an egg or a chick at the very beginning.

B thinks chicks too young for meal worms. B evidently considers the chicks ^{still} too young for meal worms. he eats all worms himself, although twice this morning he took a worm and prepared it with unusual care on the ground so that I thought it was certainly destined for the nest, but in each case he ate the worm himself.

On one of these occasions the lone youngster of the preceding brood came too, but B did not feed him.

May 11th.

B does feed both broods. B ^{still} does feed the young thrasher of this year's first brood, but not very graciously and then only at long intervals. Most of the time when he sees him he either ignores him or makes a feint rush at him or runs over him.

I find Rhody's
fourth nest,
Sta. 5.

4 P.M. I went over across Dimond Canyon to Oakmore Highlands to a point where Rhody has been reported as seen crossing the road more than once. As the crow flies it is about ⁷⁵⁰ 1,000 yards from here and about 200 feet higher across a deep canyon. The hillside is steep and covered with the usual thicket with open spaces. of live oak, etc. Houses are being built and roads are being graded. I entered the thicket near where it looked like territory such as Rhody might favor for nesting and loafing purposes. In about 5 minutes I came to a small clearing and saw Rhody with a mouse in his bill following another road-runner into the thicket at my left. I followed and overtook him confronting his mate on the ground and wagging his tail sidewise. She bolted and he followed in leisure^{ly} fashion, not at all alarmed. The brush was very thick, but by looking along the ground I could see Rhody minus the mouse going up into a bush about 8 feet away. I sat down and waited. In about 2 minutes he came to me with perfect composure and took worms from hand, waiting patiently for each. Whenever I was a little slow he hrooded softly. When he had eaten all the worms I left him in possession of the field after having verified the existence of the suspected nest (which I did not examine) about 8 feet away in the low scrub oak (a mere bush) under which I sat. It was about 6 feet from the ground. The oak is near the edge of a vertical bank about 20 feet high forming the eastern line of the road directly below.

May 12th. to 17th., inclusive.

(Absent 3 days of this period). Everything reported normal with the thrashers and Rhody making occasional visits to the cage for meat, and to play with the magpies.

The young thrasher has not been chased away yet.

May 18th.

About 9 A.M., when I went out into the garden, B came promptly

for worms for the nestlings; the spotted towhee ditto for her brood (It is the female), now out of the nest.

For the first time also, a brown towhee came to me for worms.

Sta. 5 visit- About 10 A.M. I decided to visit Rhody's Sta. 5, not having gone there for a week, intentionally. I had quite a job relocating the nest as Rhody was not there to help me. However, I found it at last, incidentally finding two thrasher or jay nests in the process. I did not examine them, but a thrasher was singing full song a few feet from one of them.

R comes to nest.

R comes down for food.

Stirs its contents.

Same and gentle at nest.

2 eggs.

In a few minutes branches began to move about the roadrunner nest and, with some difficulty, a bird was seen to enter. I talked to it from a distance of 10 feet and displayed worms and meat. This aroused immediate interest and the bird (Rhody of course) descended and came to me to take the meat and worms from hand. I withheld further supplies and R went back to the nest and stirred something around in it with his bill, then settled quietly as if incubating. I went to it and offered a piece of meat at its rim, holding it firmly. Rhody immediately began picking small pieces off of it very gently and swallowing them instead of grabbing the whole lump. He showed absolutely no fear. Finally he showed that he wanted the entire piece, so I let him have it. He stood up in the nest, stepped to the rim and dropped quietly to the ground carrying off the meat unhurriedly, presumably for his mate, who was not to be seen. I felt in the nest (It can be reached from the ground). Three eggs! At last they have "gone and went and did it!).

May 19th.

I was away all day, but Dr. Reynolds reported Rhody as seen on his roof supposedly en route here.

²⁰
May 19th.

B comes into dining room.

Brownie came into the dining room at breakfast time to get food for the nestlings.

r. R. telephones About 8:30 A.M. Dr. Reynolds telephoned that I should be pre-
body on way here.

pared to see Rhody shortly, as that bird had just gone down his
driveway after having climbed over the stile crossing the fence
that runs along the top of the bluff that bounds his property on
the east overlooking Dimond canyon. Reynolds suspected that this
might prove to be the route followed by Rhody between the nest and
this place.

R arrives.

About 8:40 Rhody was here drinking and, when offered meat,
took it from hand, greeting me with a soft whine. I kept in touch
with him in order to observe what his return route to the nest might
be. The Reynolds place is in ^{almost} direct line between the nest and here.

Return route to
nest.

Observations on Rhody from 8:40 to 10:45.

Eats and
loafs.

Up to the time he decided to go back to the nest (at 10:30) he
spent most of the time in preening, taking worms from hand and catch-
ing them expertly when tossed to him at distances of ten feet down
to two; sunning himself and then cooling off in the shade. (Temp.
76); scraping leaves away with his bill looking for worms that he
thought I should have tossed (but did not); dusting; visiting the
cage for meat but ignoring the magpies; chasing a yellow bellied
racer. but not attacking it or trying really to catch it. allowing
it to proceed unmolested after it had gone through the wire fence.
He was not interested enough to follow it further. After this, as

Chases racer.

Chases towhee

he was filled with food, he became frolicsome and chased a brown
towhee that was trying to lead him away from the vicinity of her
nest, but not trying to catch her. since whenever she stopped, so
did he and waited for her to move on again. This lead him to a

Cools off.

A competent
flight.

broom bush where he cooled off for 5 or 10 minutes and then suddenly
took off in flight curving expertly about through the trees, landing
in the street below headed in exactly the opposite direction of his
initial course and toward the south east. This put him in line
for the nest. I went with him, sometimes leading. His general direct

Off for the
nest.

returns via Reynolds' ion was toward the nest a half mile away (approx.). His deviations were slight, being mostly to avoid obstacles and motor cars. He

Over roof followed me up the Reynolds' driveway, then went up to the roof.

I hurried around to the canyon side and he dropped down to my feet and climbed the same stile over which he had first entered. sitting there for several minutes with three of us watching him 10 to 20 feet away. From that point the nest is perhaps 500 yards away and 300 feet higher, the bottom of the canyon 300 feet lower. (All guesses). The street below 40 feet lower. He took off at a downward angle of about 45 degrees, landing on the far side of the street. From there he took off across the canyon in a sailing flight beginning with a downward swoop followed by an upward sail--no flapping of wings, landing much lower than his starting point. From there he was seen to start his climb upward through the dense growth after a preliminary dusting. His whole course thus far was virtually by the shortest, but not the easiest route by any means.

B ceases feed- Brownie seems to have stopped feeding the young thrasher, but young thrasher? has not chased him away as yet. He is very tame.

May 21st.

Visit R's nest, I went up to Sta. 5 a little after 7 A.M., hoping that Rhody would be on the nest so that there would be no objection to my examining it. However I found him sunning his back on the ground near it. Comes to me. not far from it. As soon as he saw me he trotted up to take a huge piece of hamburger from hand. It dropped into the dusty leaf-mould and was entirely covered with black humus, but he swallowed it just the same. I offered him another piece, hoping that he would take it to his mate, but he was not interested and resumed his sunning; consequently I left without going to the nest, all preferring to get the other bird (if there) used to me gradually. I have not visited the nest since the eggs were first found.

1

B takes alligator lizard to nest.

Brownie took a small alligator lizard to his nest, but, as I or else that the nestlings did not watched there, decided that it was too large, so dropped down to need it, the ground and ate it himself after a struggle. On his return to the nest he was offered a worm. Instead of ~~it~~ giving it to the brood, he ate that also.

B's left wing still defective.

B still has the missing or defective feather unreplaced in his left wing.

May 22nd.

Kack lays egg.

About 9 A.M. Kack (the female magpie) was seen to leave the nest. Inspection revealed an egg, which for some reason had not been carried off. Oof was temporarily confined in the adjoining compartment.

R.R. on nest.

About 9:15 I went up to the road-runner Sta. 5, seeing no birds off duty; but one was on the nest and left undisturbed as it showed no disposition to respond to offers of food. *from 10 feet away*

Only 2 eggs now.

I returned two hours later and approached the nest carefully. One bird was on it, but left when I was within about 3 feet. This is thought to have been Circe. There were but two eggs in the nest. (Did she carry one off with her for safety?)

Sta. 4.

Went to Sta. 4 to see if there were a possibility of Rhody's maintaining two establishments. The nest, examined inside for the first time, was found to have reached the lining stage and fragments of the wadding from an old quilt were found inside. As it also contained many dead oak leaves, it is clearly abandoned.

May 23rd.

Rhody not seen here today.

Local birds much alarmed.

About 2:30 P.M. there was a great scolding in the upper garden just outside this window. It seemed as if all the local birds had collected. Brownie's and Nova's cries sounded above them all.

With the assistance of the birds a big cat was located and shot.

B was about 10 feet from the cat at the time but did not fly away

"hysterical" or cease his cries for a moment. keeping his attention fixed upon the moribund animal. which had unusual vitality even for a cat.

Watches
funeral rites.

Don't come
to me.

Has "scrip-
ups".

Even after I buried it B kept near and watched the grave scolding all the time. He used nothing but his monosyllabic "scrip", which sounded more like "whip" or "whick" than usual. It is impossible to write it. It was perhaps 15 minutes before he would even come to me and then he scripped all the way. while sitting on my hand, and even while swallowing the worms. It seems as if he had to scrip and that it was beyond his control. for he scripped even with a worm in his gullet, with a choking sound. I have never seen him so excited before.

Young thrasher
unseen today.
fresh feathers

Local "var-
mints".

The young thrasher was not seen today. but there were fresh feathers at the oval lawn this A.M. that might have belonged either to a thrasher or a towhee. A cat (not the one shot) was known to be here about 8 P.M. last night. This is really a dangerous place for birds: with hawks, cats, skunks, dogs, 'coons, weasels, opossums, (possibly six) ~~elvet cats~~ five kinds of snakes, ground squirrels, amateur "naturalists", "bologists", boys with guns, and "collectors". I wonder if the alligator lizard should be added to the list. Rhody (?).

May 24th.

Young thrasher
safe.

The young thrasher was not eaten by the cat.

R here.

Rhody was here for two hours in the middle of the day when I was away, doing all the usual things.

May 25th.

Rhody "psychic!"
Odd coincidence.

At 10:45 A.M., as I was gathering up the motion picture apparatus to take out to the Cooper Club meeting to show the pictures of Rhody, a light tapping was heard at the west window of the living room and there was Rhody himself looking in at me. Perhaps he knew what I was about and wanted to convey some last instructions before intimate details of his life were revealed to the public. I have never seen him at that place before. The window is about

10 feet above the ground. I opened it and handed him the worms that he evidently expected.

Both Rrs
incubate?

Julio reports that he stayed about until some time after noon. Plainly off duty.

May 26th.

all at R's nest.
on job and
very friendly.

Called at the road-runner nest about 11 A.M. A long tail was sticking up out of it vertically. Sat down and talked to the occupant, who began to peer over the edge at me and then came down for meat, thus proving to be Rhody himself. While he was off I went to the nest. He returned unhurriedly and unalarmed, sat on

still 2 eggs.

the edge accommodatingly while I felt the two eggs still in it, then settled upon them calmly and accepted worms handed to him one at a time. He behaves just like Brownie at the nest. ^{Apparently both} sexes incubate.

behaves like
B.

Young thrashers
leave nest.

The young thrashers of nest 11 came off some time this morning.

May 27th.

Another
coincidence.

Oddly, K.D. reports that the second brood of the year at Bancroft's also left the nest yesterday. That is near Walnut Creek, east of the hills, in the "rain shadow" where the climate is of more continental type, with greater extremes.

Two broods of
thrashers here.

The young thrasher of the first 1975 brood is still here, so that there are two broods here at the same time. (For the first time?)

R here and very
tame.

Rhody, on his time off, arrived sometime before 2 P.M. I did not see him until I happened to go to the cage, finding him in there at the meat. When he came out he was very tractable and followed me like a dog by a roundabout route to the work shop, where I went to get him worms. I offered him the two alligator lizards, but he only wanted to play with them. (One of them had the other in its jaws). He would only flirt his wings over them until one bolted; then after a run of about 50 feet in which the lizard had a head-start of 10 feet, R caught him and tossed him up into the air about four feet. The lizard puffed himself out and showed fight. R

Plays with
alligator lizards.

merely looked at him curiously and came back to me. However, when the lizard again darted away, Rhody, ^{now} handicapped by about 30 feet, overtook him after he had made about 10 feet, but merely chased him into a crack where he was satisfied to abandon him. An hour later, ^{R remembers where lizard went for hour.} however, he looked for him there, having wandered about in the meantime in another part of the garden, apparently not forgetting him.

^{R sits on bench with me.} I moved to different places and sat down, R eventually coming to me voluntarily, winding up by jumping up and sitting along side me on a bench, where he preened contentedly and waited patiently for worms to be handed him one at a time. This perplexed Brownie, ^{his perplexes B.} who wanted worms too, but did not dare to approach from the front nearer than about 8 feet. He solved the problem by going up into a camphor tree behind me and working down through the branches until he could reach my outstretched hand. R showed no hostility.

^{R returns to nest.} When Rhody decided to leave about 4 P.M., I went with him, his route differing little from the last occasion, though he took off for his sail across the canyon from a tree about 40 feet from the stile. ^{A fine swoop.} This time he sailed all the way across, without stopping at the street below, in one magnificent swoop, beginning at a downward angle of about 45 degrees as before, with a long curved rise at the end. He did not flap his wings at all.

^{Has good time here.} While at the cage R did not play with the mirror although he looked at himself in it placidly. In the shop-yard he went to the sill of the tool house window and boomed once sonorously, then out through the gate and into the tool house to look at the window from the inside. In following him I missed him for a minute or two, but he notified me of his new location by booming once again from the limb of a tree almost over my head.

May 28th.

^{B chases B2.} Brownie chased the young thrasher (Bb2) determinedly today, though not coming to contact with him.

parent thrashers The young thrashers of nest 11 were promptly divided between
divide brood.

Brownie and Nova as seems to be the custom when there are two.

B3 is most precocious youngster seen here. B3, the one supervised by Brownie, is rather precocious and allows close approach without moving away; he ran to me with B the morning

of his second day off, and when B stopped a few feet away, came all
usual agility the rest of the distance alone. That night he made short (downward)
flights in seeking a roost and managed with considerable agility to
climb up a slender baccharis branch, transfer to a hanging branch
of the old oak and climb well up into it without guidance from B,
who merely watched and then went off to perch in the acacia which
he adopted as an alternate to the dormitory tree.

here. Rhody came again for his meat, though I did not see him. He
left his lop-sided K tracks on the sand spread at the entrance of
the cage.

May 29th.

B feeds B3 only. B confines his attentions to Bb3 exclusively and if I furnish
him with enough food, does nothing else but loaf with occasional
short song, which Nova sometimes answers with her peculiar high
voice.

R comes. Rhody entered the cage for meat at 1:45, taking two large help-
ings to which he added worms from hand. He left for the nest at
I go to nest to watch for arrival. 2:15. I wished to see him arrive, so drove there by car. (1.4 miles)
Circe on job. When I got there Circe was on the nest, but left after a half hour or
I guess correctly of emergence. point where I thought Rhody would probably cross it. In just 1½
Takes him 1½ hours more! hours he did, making directly for the nest, up the almost vertical

25 foot face of the cut. When I spoke to him from the car, he stop-
ped for a few moments, and then went on quickly. (Later: Learned later
he was seen carrying snake meantime).

Three eggs were found on the 18th. Road-runners (Dawson) are
reported to lay irregularly; also one of the three has disappeared,
so it is impossible to check the incubating period to date, though

it would seem that certainly at least 14 days have passed since the laying of the first egg, possibly more.

May 30th and 31st.

Everything normal in the thrasher and road-runner cosmos. B2 seems to have been chased away pretty effectually. Rhody did not appear here on either day; I hope he is busy with young ones. Food is abundant and there will be no difficulty in getting plenty of lizards and young snakes in the gardens, fields and brush. R was seen carrying a snake at the Robinsons' on one of these ^{three last} days. (See insert bottom of p 973 - which seems to show up

June 1st. and 2nd.

Went with Dr. Reynolds to the road-runner nest on the first, observing a bird sitting quietly in the nest and not disturbing it.

June 3rd.

Road-runners score at last. At 9 A.M. (Temp. already 80) went to the road-runner nest and tried to induce the occupant to come for worms and meat without success; probably Circe, as, on closer approach, the bird slipped out into the chaparral quietly. I reached down into the nest and immediately an inch or more of an index finger was engulfed and subjected to a strong vacuum. There were two babies eager for food, trying to swallow me whole and making a soft sort of buzzing hum. I left immediately in order not to disturb Circe further. As I approached my car in the road below, she was seen standing by it, but left after one good look at me. At no time did the bird make any attempt to intimidate me or decoy me away, the only evidence of concern being its departure from my immediate vicinity. There were no fantastic evolutions of any kind and no apparent fear for the young. A supply of meat was left near the nest. (By me)

June 4th.

At the Road-Runner Nest

At about 3 P.M. went to the road-runner nest hoping to get a look at the babies. Rhody himself was on the job, sitting high

and merely shading the youngbirds from the sun, panting continuously. (Temp. 84). ^{to me} He came down almost at once for food, then after a brief absence in the brush (perhaps a half minute) returned to the nest. He considered taking a small piece of meat with him, but decided against it and ate it himself. Heretofore, in order to stand at the nest, it has been necessary for me to occupy a conspicuous position near the edge of the bank where passers-by could easily see me if they happened to look in my direction, and where, due to the slope, it was impossible to look into the nest. This time I cut a passage way through the chaparral from the opposite side, Rhody not objecting, and was pleased to find that it was possible to stand at the nest and look into it from the ground and be concealed at the same time from all persons. R showed no fear at all and began reaching for my offerings as soon as they were presented, but ate everything himself. The chicks were evidently well fed, as they did not ^{and appeared to sleep.} stir. Since they were partly covered by Rhody, they appeared as more or less formless masses with what looked like wet feathers (perhaps pin feathers) of road-runner coloration.

Rhody was very gentle toward me, showed no hostility or fear for the brood, allowed me to touch them, hrooded once very softly and twice made one syllable of his rattle-boo which was barely audible. As new behavior: Instead of snatching worms and meat rather hastily as is his usual custom, he would not attempt to pull either away from me, but would wait until I had plainly let go and then withdraw his head. When he had clearly had quite enough, instead of refusing it point blankly at first, he would still reach for the meat or the worm and hold it by one end while I held the other and either allow me to withdraw it without resistance or lay it on the edge of the nest while he still had hold of it, releasing his hold when I did the same. I could only interpret this as

tactful notice that he had had plenty, but that he wished me to understand that my efforts were appreciated and would be welcomed in the future on suitable occasions! Such being the case, I retired after removing a twig which interfered with the free movements of his head while in the nest.

The nest is lined with dry grasses--as far as I could see--is shallow and looks small for so large a bird. I can understand now that his trying out Brownie's nest to see how it might fit was not such an absurdity after all. (is it see hole)

June 5th.

No observations on local birds--absent at Point Reyes to visit the rookeries of sea fowl.

June 6th.

At 3 P.M. went to the road-runner nest. Circe was on it. I went off to some distance and returned after a few minutes to find that she had left the nest and was not to be seen. This gave me an opportunity to have a good look at the chicks.

They are very light in color, looking almost white in the semi-darkness. They seem small for a bird that will ultimately be quite large. Their eyes are now open and when I extended my hand toward them, they opened their mouths and reached for my fingers, quivering their wings and making their soft hum-buzz. I discovered that they are "dangerous" animals; before I realized it one of them had swallowed the end of my little finger to the second joint and it required considerable effort to remove it without pulling the youngster out of the nest and perhaps injuring his delicate

"insides". I gave him a piece of hamburger which he swallowed easily with no need of assistance. The other was similarly treated. In feeding one it is necessary to see that the other does not "get" one in the meantime as they are pretty voracious and are entirely without fear at present. I gave each a meal worm and it was swallowed instantly. Most very young birds that I have observed in

their nests need to have the food pushed down their throats beyond a certain point, otherwise they are incapable of swallowing it. Except as stated, no more food was given them, since I do not know whether, with these birds, it is customary for the parents to give food some initial preparation, such as partial pre-digestion.

faeces in sac.

nest clean

use precaution

account Argen-
tine ants.

As with the thrashers, their faeces are enclosed in a sac and the parents evidently dispose of them, for the nest is immaculately clean. This is an especially wise precaution in a country which is now infested with Argentine ants. A foul nest invites the destruction of the young by these ants.

plumage.

Tails.

placing of nos-
trils .

Their down, or feathers, whichever it is, lies close to their bodies in parallel streaks, giving the wet appearance previously noted. They have ridiculous, little pointed tails. It has been pointed out (Dawson) that the placing of their nostrils "well forward" and their prominence give the young birds an unusual appearance. However, although I looked for this effect, or perhaps because I expected to see something like it, the nostrils did not look prominent to me nor placed markedly far forward.

Rhody returns
with food.

As I drove away I saw a road-runner carrying something in its bill in the garden of a house in course of construction a hundred yards or so from the nest. It paused when I spoke to it and naturally turned out to be Rhody. Consequently I followed him to the nest and saw him give a lizard(?) to one of the chicks at a distance of about 10 feet. He then waited on the edge of the nest, looking down at the rear end of the bird, apparently waiting for it to defecate, which is what the thrashers do. However nothing happened, so I was unable to observe disposition of waste matter. R then came down for meat, which he ate himself, then took two worms to the nest, holding them in his bill and hrooing softly. (By this time I was two feet from it, more or less). Neither youngster appeared anxious for more food, so he finally swallowed both worms.

annerism like Rhody wanted nothing more from me, turned his back on me and stared
thrashers' off over the country intently as if watching some definite object.
He ignored alike offers of worms and flicking of his tail, but did
not freeze. This is very like the thrashers when they consider
my continued presence at the nest no longer necessary for the well-
being of the infants.

Nest insecure? This nest is already sagging at one side, not being so secure-
ly placed as any one of the three preceding preliminary structures.
A piece of burlap has been incorporated into it. Judging by the
semi-detached mass of twigs just below it, they had trouble in get-
ting the platform started.

June 7th.

Call Brownie. Brownie now comes to me when I whistle an imitation of his
with his own bugle call. "A" song, or bugle call, almost invariably.

3:38 P.M. I was at the road-runner nest at 2:30 P.M. with a
live lizard to determine whether Rhody would feed it to a nestling
without partially digesting it himself and thus ascertain whether
it would be in order for me to give them these reptiles direct in
the future.

In absence of Neither parent was at the nest. When the youngsters saw me
parents, young approaching they stretched their necks toward me, opened their
plead for food mouths and quivered their wings. I had not moved a hand toward them.
on seeing me.

Rhody comes with In ten minutes Rhody came with a much larger lizard than the
lizard, one I had brought, passed indifferently within two feet of where I
He expects young sat on the ground six feet from the nest, climbed up and pushed it
to swallow head first into the gullet of one of the youngsters, leaving the
without help. tail and more than half of the body projecting. After that it was
all up to the little fellow to do the rest, which he accomplished

R now takes after somewhat of a struggle. Rhody then came down to me and took
my lizard and gives the live lizard from my hand. He took no chances by playing with
to young. it, but disabled or killed it by squeezing it hard in his bill.

He then gave it to the other bird, who made short work of it.

comes to me since it was smaller. R then came down and stood in front of
for food for him-
self. me to see what else I had to offer. This consisted of meat and

Hovers nest- worms which he ate himself and then retired to hover the nestlings.
lings and hroos.
settling himself and hrooing softly.

Circe comes. In a few minutes I saw Circe approaching, apparently before
her behavior. she saw me, and before Rhody saw or heard her. When about 20 feet
away in the bushes she caught sight of me and retreated with a
rustle of dry leaves. This attracted R's attention and for the
next half hour or so he peered in all directions in an effort to
keep her in sight as she approached now from one quarter and now
from another, completely boxing the compass, and rattle-booming
a half dozen times. R did nothing to encourage her to approach
nearer and made no response, vocally, at any time. Finally he
ceased watching and, on turning my head as much to the rear as poss-
ible. I saw Circe preening about 20 feet behind me. She had not
been carrying food at any time, and was again out of sight when I
left at 3:30, after offering Rhody worms at the nest and having
them refused.

June 8th.

Rhody on nest, whines I went to the road-runner nest at about 4:50 P.M. and remain-
on seeing me. ed about an hour. When about 6 feet from the nest Rhody greeted
me with his soft, but high-pitched whine, just audible at that

Feeds young with distance. He immediately took the piece of Hamburger offered and
Hamburger. put it into the mouth of one of the youngsters without pushing it
down, depending upon its ability to complete the process, which it
did, Rhody merely trimming the edges a bit where they protruded
from the sides of the beak.. The other chick tried to get a portion
away from his nest mate without success. Both "hum-buzzed".

Precocity of A second offering of meat was eaten by Rhody himself, as was also
other chick a third, no attention being paid to the second chick. A fourth

Rhody repeats offering was refused by Rhody, in his courteous way, by his reaching out and taking it in his bill gently without removing it from hand.

After waiting a few minutes, another offering was made which was again refused in the same manner. Worms were then offered, which he took with great delicacy one at a time, until when he wanted no more, instead of repeating exactly his meat-refusing behavior, he took the end of a finger in his bill instead without exerting perceptible pressure, releasing it in a few seconds. In all the time I was at the nest he did not feed the second bird, removed no excrement, took frequent short naps, occasionally aroused and looked about as if to see if his mate was approaching and seemed perfectly at ease. I put a finger under him once and he made one syllable of his rattle-boo--very softly, but showed no resentment otherwise. Certainly a very gentle and courteous bird.

He had evidently just had a good dusting before going on duty as at every slight movement, either of his or of the youngsters, a slight cloud of impalpable dust would arise and drift away, reminding me that his "Christian" name of Dusty was even more appropriate than I had supposed in the beginning when he was christened Dusty Rhodes. Circe did not appear on this occasion and I saw no more than the heads and necks of the "squabs".

There is a gap of four days between the time when eggs were last seen in the nest and the time when the young were first found in it; as a consequence their age can not be determined. It is not more than about 10 days and not less than about 6. The mean of these is 8. Judging by Rhody's behavior as regards loafing time, I am inclined to think that 8 does not differ much from the truth.

A small newt (salamander, waterdog) was given to B, who after pounding it about a bit, gave it to one of the youngsters who swallowed it easily.

June 9th.

Rhody's behavior
with two
persons at
nest.

About 9:30 A.M. Dr. Reynolds and I went to the road-runner nest with two live lizards, meat and worms. We wished to test Rhody's reaction to a stranger at the nest and to two persons there.

He takes liz-
from Reynolds.

Accordingly Reynolds went in first and I kept out of sight. Rhody was on the job and, with slight hesitation, took the lizard from Reynolds and gave it to one of the chicks after only a squeeze or two. He did not object at all to the doctor's presence. I then followed and offered the second lizard, Reynolds retiring to sit on the ground in full sight about 6 or 8 feet from the nest. R took the lizard promptly. This time he slapped it against the nest structure once or twice, though not hard enough to injure the animal, and fed it to the other (presumably) chick. He was not apparently disturbed by the presence of two persons, though of course, he would naturally have a stronger incentive to stand firm at the nest than away from it. Meat offered to Rhody was snapped at by both young birds and small pieces torn off. The snapping of their bills was audible to Reynolds, where he sat, as also was a soft hroo or two by Rhody; but a whine by the bird was not, nor was the buzz-hum of the youngsters heard by him at that distance. When the meat was laid on the nest, R ate it promptly, but wanted no more, although he did not use his polite gesture in refusing it. I touched his bill--put hand under him and chicks try to swallow it. the youngsters who immediately tried to swallow my fingers.

Youngsters
snap at meat
offered R.

I touch R's
bill--put hand
under him and
chicks try to
swallow it.

Quail Episode

On returning about noon I was advised by Julio that 19 of the 21 eggs in the quail's nest had hatched and that the brood had left the nest. The two remaining eggs were placed in the magpie nest. Oof, the male, promptly took them and buried them.

About 3 P.M. neighbors reported about 15 or 20 young quail drowning in a storm drain about 150 yards from here. I went there and found that they had rescued eight and ten were drowned.

Presumably this was the same brood. The eight were cold and wet and covered with Argentine ants, but showed faint signs of life. They were brought here and placed in an oven at about 120 degrees. then in a "double boiler" heated by hot water at about 100 deg. At about 3:30 all but two were out running around the floor. In the meantime two "brooders", one electrically heated and one heated by gas were being overhauled and put in commission for their reception. All of the youngsters but one or two are pretty lively. This is the status of matters at 4:20.

Bb2 returns. Bb2, alias: Roughneck, because of ruffled neck feathers from birth, the survivor of the first thrasher brood, has been here all afternoon, making free with the suet mixture, occupying his old haunts, but having apparently forgotten what meal worms are for, as he will not take them. He is fairly tame.

June 10th.

The quail brood.

The home-made, thermostatically controlled "Brooder" worked well all night and the 8 young quail were found bright and active this morning. There was a pair of quail hanging about the general vicinity of the nest and the brood was released near them at 7:30 A.M. At least one was seen to go to the male bird and I retired from the scene. At 9 A.M. five of them were found cold and weak, scattered about and incapable of locomotion. Nothing could be seen of the other three, but a cock quail was giving his guard call near where last seen. The five chicks were restored and to the brooder now (10 A.M.) are again lively.

10:30 A.M. They have been placed in a large box so disposed as to give them their choice of sun or shade, with young pheasant food and water and an improvised brooder in the corner in which they have taken refuge.

Rhody and
family.

12:00 M. I went to the road-runner nest about 11 o'clock. It was evidently Circe's shift, but she had slipped off and was in the bushes nearby, booing 2 or 3 times during the hour I spent at the nest.

One of the youngsters seemed somewhat hostile and raised his crest at me, refusing food at first; but finally accepting it and snapping at it greedily. The other was more timid, but he saw the light too in the end.

All pin-feathers have burst their sheathes on both birds. Their skins are as dark as that of the darkest negroes seen in this country.

The pupils of their eyes have the same phosphorescent appearance noted in the case of nestling thrashers.

Their tails are no longer pointed.

Each feather terminates in a long white hair, slightly curled.

I took them out of the nest one at a time. They offered little resistance. One is much larger, heavier, stronger and more active than the other. This is the one that raised its crest, which already has a metallic sheen.⁺ This one can ¹casp a finger with his feet with a perceptible grip, though the feet and legs of both are weak and rubbery looking.

They were very tractable when held in hand (one at a time) and each accepted food readily after a little urging, buzzing softly. This hum-buzz, when the young bird is held close to ones ear--for the sound is faint--is strikingly similar to Rhody's whine and seems to be the immature form of it, although it is made with closed bill, whereas Rhody opens his mouth ridiculously wide for so small a sound.

During this time Circe could be glimpsed about 40 feet away, apparently not much perturbed, since she preened often. (The adults have been moulting for some time).

I had hoped that R would come while I was handling the youngsters so that his reactions could be observed, but as I saw no signs of
+ Aug. 23 - Per contra see Dawson

him, I replaced the last youngster and turned around to find Rhody a couple of feet behind me where I could have stepped on him. He did not seem to be worried about anything and had already appropriated the dead mouse I had brought with me. He went up to the nest in leisurely fashion, but did not take the mouse with him. I offered it to him there, he took it, but dropped it upon the youngsters. I picked it up and handed it to him again. He held it a while, but again dropped it as before. (Training the chicks to pick up their own food?). He seemed to take it only out of politeness and let it slide out of his bill the last time, like a man falling asleep with a cigar in his mouth. Once more I salvaged the creature, and this time Rhody, either despairing of terminating the cycle, or else as a self-sacrificing gesture of courtesy, swallowed it himself. After this he did not want meat for himself or the babies, but he did condescend to take a worm or two so as not to hurt my feelings.

I tired a couple of movie shots at the young birds in the nest and at Rhody settling upon them, at 2 ft. distance, but the light conditions were so trying as to make favorable results doubtful and I had no reflector. The subjects were in deep shade with scattered spots of high illumination, camera ^{of necessity} pointed sunward.

Rhody's behavior in the nest indicated an untroubled mind; the only time he showed any excitement was when a large blue-bottle fly buzzed around his head. He made fierce efforts to catch him, dodging about the nest and even stepping out of it on to my hand to get a better shot at him, stopping one stab just a little short of my nose; the fly, however, escaped. I am inclined to think that all this was more or less a manifestation of his sporting instinct; because he was not hungry.

June 11th.

The young quail chicks, with forced feeding, are all alive and active this morning.

Visited the road-runner nest at 10 A.M. with two lizards in a bottle, one of them by measurement exactly six inches long. Rhody, on the nest, Circe making her presence known in the bushes. When R saw the lizards he stretched forth his neck and whined. I gave him the 6 inch one first. He squeezed pretty thoroughly while one of the chicks made repeated snaps at it. It took 5 minutes for the chick to swallow it. R "asked" for the second one with repeated whines. This he also squeezed, but during the process, which lasted several minutes, he kept up a continuous crooning song: Hru, hruh, hr-o-o-o-o-o-o, hr-o-o-o-o-o. This seemed to be an invitation to the second chick, although R made no effort to hold it where he could get it, looking off over the country. Finally he got careless. The lizard escaped, dropped to the ground and ran off so swiftly that I could not follow it with the eye. R immediately dropped down and began a long search on the ground and along the branches below the nest where there is a mass of dead twigs, making progress difficult. In fact he fell once and lay sprawled amongst them. He climbed up under the nest and began pulling out pieces of it and dropping them. I could not imagine his purpose, but he pulled out the lizard and this time was more careful, delivering it to the other young bird, still alive.

He then spread himself over them carefully. They "boiled" about for a time, but finally poked their heads out through his breast feathers and subsided. I then fed Rhody himself and began exploring underneath him with my hand. He protested mildly a few times with soft, single snaps of his bill, but continued looking into the surrounding brush, raising himself slightly. Finally he pecked the back of my hand once in a casual sort of way, not hard enough to break the skin, as a warning I suppose. When I persisted he pecked me once again harder, breaking the skin; but still this was a "pulled" punch. He did not seem angry, merely somewhat impatient.

This was the signal for me to leave.

Circe was not seen to carry food on any of her numerous approaches. She dusted and preened 20 to 40 feet away.

Bb2 here. Roughneck is now seen frequently, mostly at the feeding station in the patio.

June 12th.

Roughneck is still here, but he keeps an eye out for Brownie.

Thrasher song. At present, and during the nesting period, song has been confined mostly to early morning hours and late afternoon, principally the former. Nova is becoming somewhat more vocal. There is no sub-singing.

About 10:15 Dr. Reynolds and I went to the thrasher nest and, the parents being absent, took out the smaller thrasher for photographing. It was noted that its faeces were no longer enclosed in a membrane. With thrashers this is a sign of early departure from the nest. While we were engaged with this bird, Rhody came and fed something to the one still in the nest, then came to see what we were doing. He did not appear much disturbed, though he hrooded repeatedly, this time with a more pronounced rolling of the r's, much like a domestic pigeon. ~~Wax added xthax larger xxbird xtaxen xrgroup~~ We tried to get the youngster to take a lizard, so that we could "shoot" him in the act, but he did not appear to be hungry and Rhody spoiled our set-up by ^{unintentionally} stealing the lizard from Dr. Reynolds' finger tips and giving it to the youngster in the nest. A Jerusalem cricket was placed ^{not far from the} ~~by the~~ chick on the ground in the hope that R would feed it to that bird, but he had other ideas and gave it to the other one. This one was placed on the ground beside the first one and while Rhody kept in our immediate vicinity, it was not possible to get all three in the field of view at the same time and the larger bird persisted in running away. On being caught once, he squalled loudly and R came to the rescue, showing

some excitement, though no evident animosity---I had expected to be pecked. The youngsters snapped their beaks, buzzed and, for the first time, emitted a rhythmical rather adult sound not easily described, but somewhat like Rhody's hroo.

From the activity of the larger bird it seemed unlikely that it could be induced to stay in the nest very long, if at all, and as Rhody did not seem to be much disturbed by our interference and the neighborhood is over-run with cats, boys and workmen, it was decided to bring the chicks here. R watched us put them into the case of the camera tripod without comment. When they were put into the car at the base of the high bank below the nest, Rhody appeared on a stump at the top, repeated his cooing song several times as if in farewell. (The first time it has been heard for many weeks). He then repeated his courting gesture of clapping his wings together over his back and disappeared. This shook my resolution, but I carried on.

On getting home the smaller bird readily accepted food from hand, but the one that had been fed so generously at the nest would only snap its beak, though reaching toward the food. The excrement of both has changed from predominatingly white to mostly black. (The smaller excreted while we had it on the ground, When Rhody found it he carried it off and dropped it about 20 feet away. It was adult in form and consistency.) The larger excreted a black, fluid mass while in the car, my attention being called to the act by the sudden arising of a very foul odor permeating everything, notwithstanding the fact that the car was open and well ventilated.

To distinguish the two birds, and in recognition of their reptilian appearance, they will tentatively divide the name Archaeopteryx between them. The big one, probably the first born, is Arky, which will probably become Archie, and the small one: Terry. A is the more assertive at present; T the more gentle. My guess is that it is a female. The skin back of their eyes is still "black" with slightly bluish cast near the eye and yellowish at rear.

Their feathers show metallic reflections. The pupils are still "fluorescent". The irides are dark brown with, as yet, no brassy ring about the pupil.

A raises his crest frequently; as yet T has not been seen to do it. A snaps his beak a great deal; T less. The hum-buzz is heard less than a sort of croo, with well rolled r. Reminiscent of the distant call of the sand-hill crane(?)

2 P.M. I have just checked up on this call. The nearest I can approximate it is: Oor, long drawn out:O-o-o-rrh. A complaining sort of sound, mostly used by A. The oo as in poor.

A is shorter tempered and has a wicked snarl.

I have made a nest for the two birds and curiously enough, since they have begun occupying it, white predominates in their excreta and the membrane is wholly or partially restored.

A's excrement is nauseatingly fetid, but not T's.

2:10 P.M. A has seemed anxious for food, pecking at it in my fingers but dropping it, ooring and snapping. His resistance finally broke down, he changed his tune to uk, uk, uk rapidly repeated, and took it hungrily. Neither needs any help.

At 3:15 I went to the nest and waited about a half hour, but there were no signs of either parent. The nest is perfectly clean. It is much more firmly supported than I thought. I find that pine needles have been used in the lining.

7 P.M. Rhody, contrary to my expectations, did not come here at all during the afternoon.

June 13th.

Quail. The young quail appear to be doing well under forced feeding.

R.Rs. Terry takes food readily, opening his mouth and quivering his wings when hungry. Archie is still afraid of human beings and does not take it so readily. It was necessary to open his mouth and put the food into it at his first feeding this morning.

Their excreta are still of the juvenile type. The foul odor of A's has gone. Both remain in the sack-cloth nest all the time. A's expression is alert and fearful, whereas T's is peaceful.

Each had a mouse to eat during the day. They are fed with a mixture of soft food, young pheasant food and Hamburger steak, moistened and well worked up together, at intervals of an hour to two hours, provided they will take it. (J. E. Voluntary)

Archie can make quite an adult rattle-boo. They are very conversational when anyone is near them, using mostly the crane-like crooing described above. The infantile hum-buzz seems to have disappeared. The colors back of their eyes are becoming more distinct. Their bills are "black", unlike those of the adults and their legs and feet light, bluish slate color. (I have no charts with which to check colors).

They are surprisingly like adult birds in appearance and behavior, and scratch and preen, industriously removing the deciduous pin-feather sheathes, stretching frequently.

Bb2 and Bb3

I called the attention of a visitor to preliminary training in defense being given Bb3 by (as I supposed) Brownie. The supposed Brownie did not "look just right" at a distance of 25 feet and closer scrutiny showed that it was Bb2 with his "mane" of neck feathers. He behaved just like a parent: allowing himself to be defeated, "pulling his punches" etc. Nothing like this has been observed here before. The skirmish was discontinued by mutual consent. both parties remaining on the field in amicable relations.

June 14th.

Archie has lost his habitual fearful expression and now looks out upon the world with intense interest and seems astonished to find nature so complex. Both of them are keenly interested in flies and even minute gnats, but have not tried to catch them.

A had a large mouse in the morning which T had tried unsuccessfully to swallow. It was trimmed down about one quarter in bulk for him by removing a slice (mostly skin) parallel to its spine and from one flank.

These birds are not great eaters, at least do not eat frequently. Archie had only one other meal during the day, and wanted no more. Terry eats oftener. Neither begs for food at all.

They are beginning to take notice of each other, nibbling each other's bills and sometimes feathers. .. They preen often and sometimes work on the others feathers (before discovering the mistake?)

They have a snarl like a cat when one steps on the other by accident. The sounds made by them in the nest remind one more of young mammals than of birds. They grunt, croon and mutter and occasionally whine. There is also a sort of mew.

It was soon noticed that Terry shakes his head (usually twice) when spoken to, the ^sreponse being instantaneous. It was found that he responded to all tones within the compass of my voice, giving some indication of the range covered by their auditory apparatus.

The excrement is still inclosed in a membranous covering. The act of excreting is accompanied by much wriggling and tail wagging and mild coks and complaining sounds. An effort is made to discharge the waste matter over the edge of the nest, usually with a distinct popping sound.

They are what a human mother would call "good" babies.

June 15th.

About 4 P.M. yesterday the young quail, who have been force-fed entirely for 5 days, suddenly discovered that they could eat for themselves and began tapping vigorously on the bottom of their box, picking up food and particles of sand. Shortly afterwards

they discovered that their feet are useful for uncovering food and began scratching about with professional skill.

On giving B's whistled bugle call this morning, B came promptly bringing Bb3 with him.

Terry was given his turn at the only mouse caught so far this morning. (8 A.M.). Later he had about a third of a mouse and two or three helpings of the special food in the course of the day.

Archie had a lizard. two thirds of a mouse and two or three helpings of the food mixture. They do not eat often.

Meal worms and the beetles which they turn into interest the young birds considerably. They watch them closely, pick them up, but either do not know that they are good to eat, or else have not learned the back and forth shuffling motion of the head which will start them going in the right direction.

They have had water in their cage from the first and have occasionally looked at it curiously and nibbled at the edge of the container. In doing this today Archie got a taste of the water and shortly after, drank in approved fashion. Terry then performed a similar experiment with the same result.

Today was a day of much stretching and flapping of wings. The latter usually followed immediately after a preening operation and seemed to serve the purpose of blowing away the "dandruff", (though probably intended as exercise?)

Nothing has been seen of Rhody or his wife for several days.

June 16th.

Archie and Terry were given several long runs in the shop yard today. At first, when tired, they returned directly to the cage and its nest. Archie ran about cockily, dusted just like Rhody, split himself down the back like Rhody to sun himself, and developed a peculiar bleating call, a long drawn out ma. (The a short as in cat). He used this and flapped his wings when he wanted to see

what was on top of, in, or on the other side of things, such as boxes or chairs or even myself!

I took both of them up into my lap and stroked their plumage, much to their satisfaction. This caused them during later periods of liberty in the yard to come to me often instead of returning to the cage. On such occasions they seemed to expect that it would be necessary for me to handle them in order to get them up into my lap and offered no objection to my doing so. Once when Archie was in my lap and Terry was in the cage, the latter noted what was going on and tried to get through the wires of the cage to join us. The open door was on the opposite side. He found this, ran directly to us, stopped at my feet and looked up. I lowered my hand, he stepped upon it and I hoisted him up and stroked his back and sides, smoothed out his tail, scratched under his wings, all to the accompaniment of pleased murmurs from him. This manipulation of the youngsters won their hearts and seemed to break down all barriers between us. They appear to consider me now as the only source of food and comforts.

Julio brought a large alligator lizard, evidently swollen with eggs (assuming that they lay eggs) and having an unusually ^{short} thick tail--the first tail like this I have seen. It was placed on the ground near the cage and promptly began circumnavigating it, opening its mouth threateningly at the birds within. Archie observed this intently, with spread tail. Later both young birds were put on the ground beside it, but paid no attention to its threats and wandered off.

Road-runners are associated in the popular mind with the hotter regions of the Southwest and the deserts, and are therefore assumed to like heat. They do like warmth, but these youngsters and even the adult Rhody, prefer the shade unmistakably to the direct sun ^{even} when shade temperatures are no higher than about 70 degrees. (6-6-65)

With such temperatures, or higher, prevailing, they do seek the direct sun rays for short periods, but sooner or later, move out of them into the shade where they remain most of the time. In order to get shade A and T will crawl under persons crouched close to the ground. That this is not for the purpose of concealment is evidenced by the fact that they will do this when perfectly at ease otherwise, and by the further fact that they will invariably (under the temperature conditions mentioned) move into the shadow of a person standing nearby even when such location is a conspicuous one. When they are in the cage and the cage placed in the sun it is necessary to insure that some portion of the cage be shaded irrespective of the sun's position. Otherwise they soon begin to pant, then move about restlessly and begin to complain or try to get out.

Except under these conditions (to which they are subjected only for the purpose of test) they are perfectly contented, at present, with their quarters in the cage, which is only about 24 inches long, 12 inches wide and 12 inches high; they regard it, in fact, as a home and voluntarily enter it as noted herein.

For the first time, today, one of them, Archie, showed that he is able to sit on a perch, ^{and} on his own initiative. They are both still somewhat shaky on their feet and can not preen when standing up without falling down.

The fluorescence of their pupils is diminishing.
 The skin colors back of the eyes are becoming more distinct.
 The portion that will be red is now saffron yellow. (A guess).
 " " " " " white is getting paler.
 " " " " " blue " " bluer.

The irides are hazel (?) and the portion that will become the brassy ring about the pupil is lighter and redder than the rest. The whitehair-like appendages at the tips of the feathers are disappearing.

Yellow is beginning to appear through the blue on their legs, giving a greenish--almost green-turquoise cast in places.
 (None of these colors has been compared with charts)

They ate only four times today, which was all they wanted. They can not feed themselves.

They are now 16 days old, with a possible error of plus or minus 2 days.

They would be easy victims for a predator in the field, although they can run fairly fast, but doubtless can not keep it up.

The difference in size seems less. T is catching up. (?)

June 17th.

The young road-runners are much stronger. They can jump up, with the aid of their wings, to a window sill about a foot from the ground covering about 2 feet horizontally in the act.

They occasionally essay sailing flights from my lap to the ground, and although they do not make very good landings, they are improving rapidly.

Both notice their reflections in the window and nibble at them. They are inveterate dusters.

Both have discovered the "spread eagle" method of sunning themselves, which Rhody, himself, has only been seen to use twice. Both also, and more frequently, use the split-down-the-back method.

When disappointed in an effort to reach an eminence beyond their present capacities, they often express their disgust in a strikingly adult boo.

They are ludicrously mature in their mannerisms and are almost perfect replicas on a small scale of their parents.

Archie, especially, is just like his father.

June 18th.

B and family. Brownie, Nova and both of the youngsters of the last brood were together at the oval lawn this morning--the first time all have been seen together.

Full song is being heard oftener and later in the day now.

Archie collects gravel. Archie began this morning to select small gravel stones carefully and swallow them. It was clear that he used discrimination. (Grind stones for his gizzard?).

12:30 P.M. Archie is beginning to pick up things and carry them about, such as pine needles and leaves.

Just now he found a crooked, rusty nail and tried to "kill" it by slapping it on the ground just as Rhody does with snakes. He brought it to my feet, dropped it, then made to be taken up into my lap.

rights of young
road-runners.

The following weights were obtained with the kitchen
scales, accuracy unknown and unguaranteed:

Archie..... 8 ounces, (170 gms.)
Terry..... 6 " (227 ").

Checking with a graduate reading in c.c. by bringing the pointer of
the scales to the same indications, gave:

Sub 1008

180 gms. and
240 "

(The scales are at least
consistent, as they gave
14oz. for both together).

First unaided
feeding.

2 P.M. Dr. Reynolds and Dr. Morse brought two dead mice and
8 live young ones with eyes still closed.

One was offered to Terry, who was interested slightly. When
it was laid down by him he picked it up from the floor of the cage,
dropped it in the nest, picked it up again and swallowed it without
assistance, using the "double shuffle" expertly. Not counting Archie's
picking up gravel, this is the first self-feeding operation noted.

Male quail
comes for
food.

While the three of us were in the shop yard with the road-run-
ners running loose. A male quail came boldly into it and approach-
ed the box containing the young quail. Although he was frightened
he persisted for a few moments, making alarm calls, then perched on
the fence within a few feet of us and finally gave up the quest.
The yard is only about 20 by 30 feet.

Quail attacks
R.R's.

At 2:30 P.M. the male quail dropped down suddenly from the roof
and violently attacked the young road runners (who were, fortunately
in the cage) notwithstanding that it was within two feet of me. He
ignored my presence completely until I chased him away. He struck at
them through the wires with his beak and beat the wires with his
wings, clearly meaning business. The youngsters were badly fright-
ened. He paid no attention to the brood of young quail. I wonder
if he blames the road-runners for their incarceration, or whether
his action indicates a feud between the two races. If the latter,
perhaps Rhody and his mate have been making inroads upon the local
quail population. Possibly, also, this indicates that road-runners
are more numerous in this vicinity than is generally supposed

Young quail
taken in
charge by
male.

This quail hung around the box all the afternoon. At 5:30, when
he was up in a pine tree, the youngsters were released. They kept
together and wandered off. The adult came down from the tree at
once. He seemed to think that there was some trick about it all
and kept his distance for some time, keeping about 6 feet away from
them. Finally they followed him away into the cover, and were
glimpsed a few times in the openings following his lead.

R.Rs vs Quail.

Mr. Robert Easton says that road-runners are shot around
Santa Barbara because they destroy the quail. Evidently there are
two sides to this question, even eliminating the matter of inter-
ference with Nature's balance. I have just witnessed an absolutely
unprovoked attack by a quail upon two helpless and inoffensive
young road-runners and the determination behind it is evidenced by
the fact that the quail, in making it, overcame its fear of human
beings in its effort to get at its quarry.

June 19th.

Terry had two of the baby mice for breakfast about 7:30 A.M.

Archie wanted nothing at that time, but about 9:30 had one of

the same family. T ate more than A during the day. I am somewhat surprised at the small quantity they eat. still I think that they are getting enough food, since they are getting all they will take voluntarily.

In the aggregate during an average day, I doubt if they consume 2 ounces each. Certainly not four. There is no indication as yet of their needing several times their own weight of food each day as young birds are popularly supposed to have.

Both are now able, at times, to pick up their own food when very hungry, but not always. Archie managed to handle a freshly killed lizard all by himself.

The skin colors are increasing in brightness every day.

While trying for a movie of A and T with an alligator lizard (of which both were somewhat fearful- though Archie displayed for its benefit), a robin was attracted to the scene and began sounding an alarm call and succeeded in gathering an audience. Including himself there were at one time or another, or all at the same time:

2 Thrashers, of which Brownie was one,
 1 Purple finch, who remained fully half an hour,
 2 Bewick wrens,
 2 Plain Titmice,
 Several bush-tits,
 " Brown Towhees,
 " Spotted "
 One Humminbird, who left soon,
 Two pigeons. Possibly they were coming anyway.

I do not know whether the lizard or the road-runners were the cause of the alarm. The lizard was a fierce one biting everything thrust at it and even going out of its way to attack things. It chased one of the young road-runners, with open mouth. Bit my shoe when it was not in motion. (The shoe not in motion). Also another smaller lizard and one of the baby mice, which it carried off. In view of this sort of disposition, I am inclined to think it was the common enemy, although when it was allowed to escape, much of the audience remained for a half hour or so longer, making comments.

- Eyesight of young road-runners.** Their vision is good. They seem to observe everything and spot hawks sailing overhead several hundred feet high. They did not mind the audience, with the exception of the pigeons at whom they stared unblinkingly.
- First attempt to kill lizard in adult manner.** Archie, in handling the dead lizard, beat it upon the ground just as just like an adult road-runner. First time noted.
- First seeking roosting place.** About 4:15 P.M. yesterday and repeated today, both A and T began to get restless and look for places to roost. Yesterday was the first instance. They sought high places. To see what they could do they were put in a cage about 3 feet square and about 4 feet high having its top amongst the branches of a tree. They were able to reach the topmost perch and tried to get higher and into the branches of the tree. This being impossible, they settled themselves on perches prepared to spend the night like old-timers. This was their first experience of the kind.
- First discontent with confinement.** They were removed to their regular sleeping quarters in the small cage, and (again another "first time") were discontented and tried to get out--even through the top. A cloth covering all but one side of the cage was placed and they subsided contentedly at once; apparently the instinct which impels them to seek high perching places on which to roost at a certain stage of their development being submerged for the time being by the effect of familiar comforts.
- Nascent roosting instinct temporarily checked.** But the little fellows are growing out of the baby stage. They will soon be able to get out of the shop yard when allowed to run there by climbing the vines on the wall.
- Growing up.** Back to the Thrashers again. Roughneck is still here, so that we have the unusual condition of two broods being here at the same time. The fact that the two together amount up only to three, which is the usual full brood when there are no accidents, may have caused Brownie, who is no mathematician, to get tangled up in his arithmetic, thus granting a longer period of residence to Bb2.

Rhody stays away. The last time Rhody was seen was on the morning of the 12th when he came to the crest of the bank as I bore off his brood. He has not apparently come to this place at all since.

June 20th.

Rhody relocated in new environment and found perfectly friendly still. I inquired at the tract office of the real estate firm handling the sale of Oakmore Highlands property, this morning, whether Rhody had been seen since the 12th. I was told that a roadrunner had been seen a few days ago in the tract to the eastward of the nest location. This portion is an open, rolling field on top of the hill, surrounded on most sides by dense thickets. Streets have been cut through it and construction work is in progress. I drove through the streets keeping an eye out for road-runners, and in less than five minutes saw a head sticking up over the grass, weeds and fern in the open about 75 yards away. I stopped and proceeded on foot slowly toward the head and found Rhody himself lying down quietly on top of the miniature mountain range formed by the backfill of a trench, a strategical point from which he commanded a view in most directions for miles while lying down. The only move he made during my approach was to stand up, take two steps toward me and take the proffered meat from my fingers! Apparently he forgets what he wants to forget and remembers what is convenient.

I kept in touch with him for more than an hour as he wandered about, hoping that he would show me where his new nest is, if he has one. The distance covered in this time was perhaps a quarter of a mile, some of the ground being traversed twice. He never once entered the woods, though frequently skirting them and staring into them. I had to go and left him in possession of the field, still in the open on the backfill again. While I was with him he caught cicadas, grasshoppers and other things good to eat. preened and threw away loose feathers from his flanks and had a good loaf. If he has a nest, clearly he had no intention of directing me to it.

This is really a beautiful field with bays running into the woods. I learned that it is to be burnt off in a week or two. With typical American carelessness, this means that the fire will run under and into the trees wherever it wills, destroying anything that the foreign scum that will probably be hired to do the work, are too lazy and indifferent to protect. Probably, also, there will be no efficient supervision. Nobody cares. "Aw, what the hell?"

It will also be fine for the birds that have nests on the lee side of the fire.

The place where Rhody was first encountered was about a quarter of a mile beyond the nest in which Archie and Terry were reared.

Archie and Terry
practice climbing
and perching.

The two youngsters were given plenty of opportunity to practice climbing and perching inside the larger cage. Archie, though wabbly is much more expert than his nest-mate. He is able, usually, to turn about on a perch and face in the opposite direction without falling off, although not always. Terry can not do it at all, but he tries. To reach the highest perch this accomplishment is necessary. Terry has many falls; after which he usually gives one disgusted boo and tries again. With help over one bad place he managed to reach the top. Archie then reached the same goal under his own power, but in doing so jostled Terry and both fell in a heap to the floor of the cage, making no outcries, but Terry ran to me at once for comforting just like a little child, to be taken up and petted while making little crooning sounds. They are very human little creatures. After seeing Rhody today I was struck by the comparative stockiness of their build at present. Rhody is lean and lank by comparison.

They drink more often than they eat, and are still small eaters. They refuse fruits. They are getting much stronger. Archie is now able to stir up quite a dust on the hard ground when indulging in his favorite exercise. He got so dusty today that it floats away from him when he moves.

On second attempt Terry was able to master a very lively lizard handed to him. The first time he allowed it to escape from his bill. He swallowed it in one gulp without apparent effort and without trying to kill it. In a case like this I am inclined to think that the lizard really commits suicide by darting down the first opening he sees when the bird has turned him in the right direction.

Archie continued to collect gravel and miscellaneous articles at intervals.

June 21st.

About 7:30 A.M. the young road-runners were still in their nest in the small cage. They seem to be late risers like Rhody. Perhaps this is a family characteristic.

About 8 A.M., when released on the ground, they wanted to get up in my lap and were accommodated.

Archie rejects his "collection". Archie shook his head sidewise and disgorged something. (He had had nothing to eat since about 5 P.M. yesterday). **It proved to be** his collection of gravel, together with some empty sun-flower shells with smaller unidentifiable objects, mostly fibrous.

This is the first observed instance here of any road-runner disgorging anything. None of the material was a part of the food furnished him by me as far as known.

Do R.Rs need grindstones?

The incident suggests the query as to whether birds of this type need gravel as grind-stones. Possibly picking it up is merely an act of curiosity or an indication of hunger.

June 22nd. to 24th, (inclusive).

During this period the young road-runners have increased rapidly in strength and activity and are now comically mature in their actions and reactions. They remain tame and friendly. Between 4:30 and 5 P.M. they begin to look for roosting places, and tonight (24th.) are having their first experience in sleeping perched in the bushes of the former magpie cage. As I shall be absent for a week or two, I have arranged to have Donald Brock, during my absence, spend some time with them each day and supervise their feeding. They are already on friendly terms with him; one of them,

Archie, having climbed upon his back today and chewed his ear.
A log will be kept showing time of feeding and anything unusual.

June 25th. to July 4th., incl., absent in condor country.

July 5th.

Road-runners. On returning found the young road-runners in good condition and tame.

Growth. They have grown considerably and are now catching up to their feet, which do not now look abnormally large.

Change in eye color. The most striking change is in the color of their irides, which have faded to a much paler tint of the same hue. The ring about the pupil, which is brassy in Rhody, is now much lighter and more conspicuous, although showing no yellow.

Handling of living food. They can now handle mice and lizards that are partially stunned quite expertly.

Archie
A "sport". Archie is still the farther advanced of the two and retains his more enterprising and aggressive characteristics. He is much more like his male parent than Terry. This is especially noticeable in his handling of food, which he almost invariably tries to "kill". He shows Rhody's sporting instincts by giving lizards and mice a chance to escape and by playing with them. However, his judgement as to the extent of the risks that can be safely taken is faulty and he sometimes allows his prey to escape.

Bosses T. He now shows a slight tendency to order Terry around

Size. I should say that they are about two thirds the length of their parents overall.

Rhody home again. The day before I returned Rhody returned, being somewhat assisted in the process by Dr. Reynolds' man, who saw him over there and followed him here, where he entered the cage while Julio was in it, got meat, etc. He also came today.

Shy while I away. Brownie was only contacted twice during my absence. He would not come to Donald Brock. I did not see or hear him until the afternoon of the first day home, when he came to me readily and jumped up to my lap for worms, as usual.

July 6th.

and children. Rhody came again today, visited the cage for meat. Paid little, in fact almost no attention to his offspring.

Brownie. Brownie seems to be absenting himself.

Rhody. R returned again in the afternoon while two of us were watching the young roadrunners in their cage. I approached him and offered him meat which he took from hand. **This is the first time I have offered him food since June 20th., and at that time (see p. 998) he was $\frac{3}{4}$ of a mile from here and I had not seen him for 8 days).** He was somewhat more shy than formerly, but his memory appears to be good.

**A and young-
sters.** I opened the door to the outer cage. R went in and got more meat. He did not seem to notice the youngsters at all, who were in plain view of him. They, however, were curious about him, but seemed to attach no especial significance to his presence, nor regret his going away without establishing some sort of relations with them.
July 7th.

Rhody home. 4:30 P.M. Rhody has been here almost continuously since first seen about 8 A.M. He has been to the cage for meat several times and come to me once. He seems to be back on the old basis and is just a little shy, more especially of quick movements which he had learned to disregard.

R and young. He absolutely disregards his offspring, even when within 6 feet of them. He looks long and lean compared with them, but:

A and T. They are getting more slender.
A rusty tinge is creeping into their irides.
They are inveterate dusters and keep themselves so saturated that the slightest flick with a finger on their plumage almost any place causes a small cloud to float off.
They are getting more "serious" looking.
They are curious about all birds and aeroplanes, but not afraid of either.
They are as tame as kittens and roost on any part of my anatomy, also using me for a take-off point. They chew my ears, pull my hair and try to pull off buttons, wipe their bills on any part of my person or clothes that is convenient.

Brownie and family. B is away most of the day, singing a little in the early morning, coming to me for worms, then disappearing for several hours. Nova is heard scripping occasionally, and a glimpse is caught now and then of a member of one of the broods. B is using the same acacia near the shop for a roosting place.

Circe. Nothing has been seen or heard of R's mate. Perhaps they have separated. His loafing around here makes it look so.

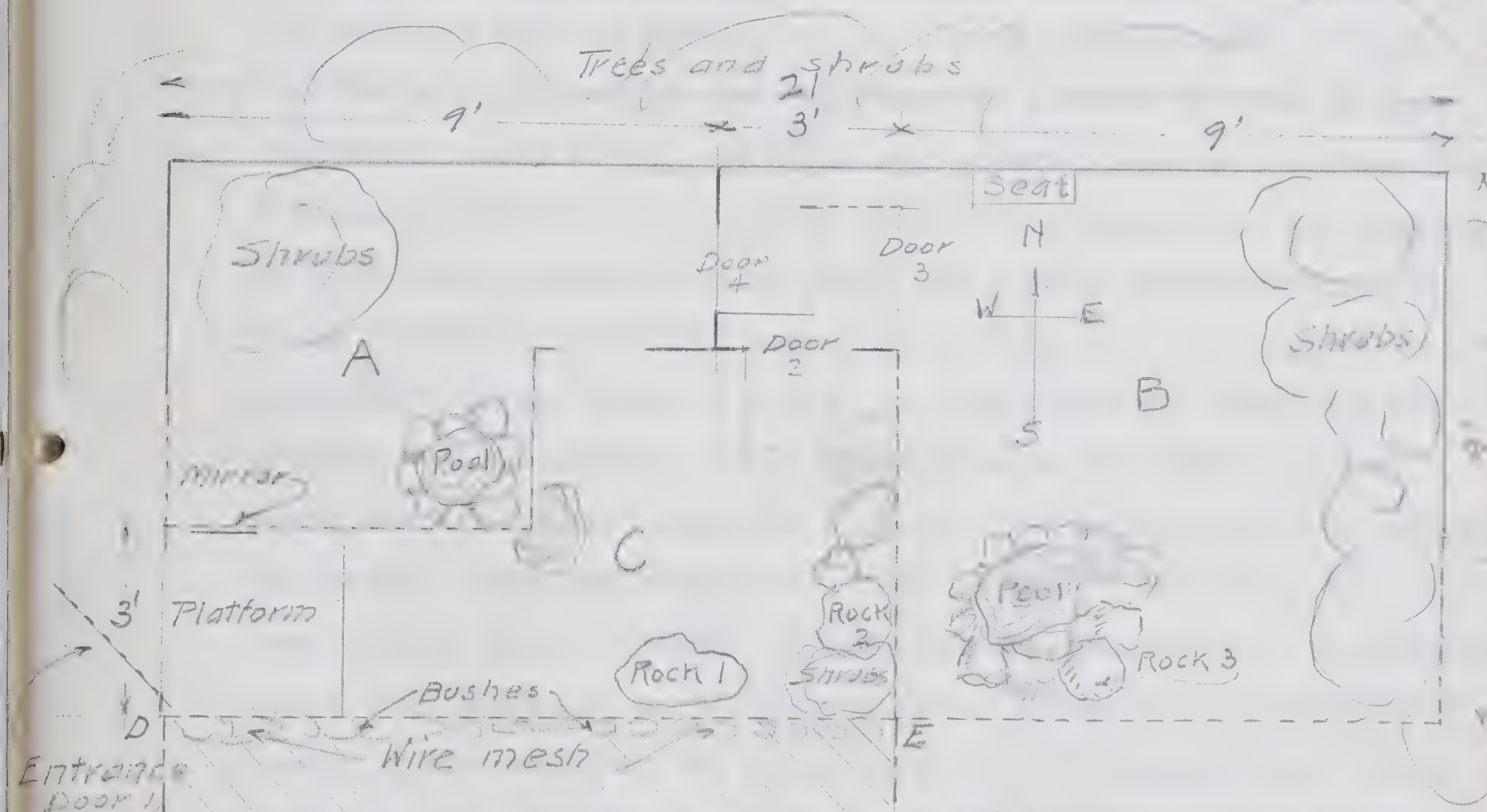
**R not in old
roost.** At 11 P.M. Rhody was not in his old roost.

July 8th.

At about 8:30 A.M. Archie appeared somewhat excited, would not take food, wanted to get out of the cage and continually peered off in the distance. This was taken to mean that perhaps Rhody had been at the cage, taken some notice of the youngsters, and was then somewhere about.

C

About 9 A.M. Rhody was in the outer compartment looking at the young birds. The cage is arranged as per sketch plan below:



The full lines represent wooden walls and partitions, the dotted: "chicken wire" of hexagonal mesh.

The young birds were in cage B with the door closed. Rhody was in cage C sitting on rock 2 watching them intently, saucer-eyed, with an expression of astonishment. Archie was running up and down the wire separating the two cages, apparently trying to get out to join Rhody. Terry sat on rock 3 looking bored. Rhody had his eye-patch colors fully displayed, but his crest not raised. A had his crest raised. R would make an occasional feint at A.

This kept up for about a half hour. I then closed the door leading

This extension, shown cross-hatched, was added Mar. 15, 1976 - 9' x 12' For photo. see P 1185 A

from C to the outside world, shutting myself in with Rhody. He was only mildly disturbed. I went into B, leaving the doors open to C, and sat on rock 3. R retired to the platform, saw he could not get out, and made no attempt, apparently satisfied to preen and look at himself in the mirror. The two youngsters went out to within a few feet of Rhody and ignored him, sunning themselves. R glanced at them casually until Archie went up on the platform with him, when R chased him into a corner rather mildly. A escaped by climbing up the wire. R did not pursue, but continued sunning and preening. The two youngsters then came back into B, climbed up into my lap, forgot all about Rhody, and dozed for several minutes. I hoped that R would be jealous of me, but he gave more attention to the magpies in cage A and seemed to think there was nothing unusual about the whole situation. At 10 I had Julio let him out. He retired in leisurely fashion to get a drink, then wandered off about his own affairs. There seems to be no bond whatever remaining between Rhody and his brood. They are just other birds to him, like magpies and rails, quail and thrashers. This is the first time he has even been seen to look at them. (It should have been noted at the proper point that Rhody, on my displaying meat, joined us in cage B also, paying no attention to the youngsters, one of whom was still in my lap).

July 9th.

Archie and Terry, A principally, continue to pick up miscellaneous trash and swallow it, such as sand, earth, dead blossoms of acacias, etc. After a certain amount of this has accumulated it is rejected, perhaps once every two or three days. Examination has failed to show any portions of mice and lizards eaten by them, either in this rejected rubbish or in their excreta.

They are small eaters, I should say. The only food they get is that which is handed to them. They will not take it more than three

(though last recently)

or four times a day and even then [^] they have to be tricked into taking it at times. The trick consists in letting them chew a finger and then when they are off guard, slipping a mouse, lizard, meat or other food into their mouths as the finger is withdrawn. Occasionally they will capture a stunned lizard or mouse themselves. Archie always makes this a dramatic episode, reproducing Rhody's antics precisely. He certainly has never seen any other bird perform in this way--not even Rhody.

Rhody continues to hang about as before the nesting season. Today he had a large piece of meat and two or three hours afterward two mice in succession. He still carries twigs, pine needles, etc. about occasionally, but so do his children.

July 10th.

Archie has developed a trick of galloping about the cage just as Rhody does out in the bushes on one of his irresponsible occasions. He usually winds up by fluttering about my feet with spread wings making his peculiar, thin, dry buzzing sound, wagging his tail horizontally (A trick only recently developed by Rhody himself) and often dusting my shoes as well as himself. He seems to be inviting my attentions, yet when I reach down to pet him, he usually eludes me. Or if I offer him food he refuses it. Often he winds up by running quickly up my back, whereupon his buzzing ceases and he makes little ooh, oohs as if satisfied, pulls my hair or ear and settles down for a stay of a few seconds to a few minutes only to go over the whole performance again indefinitely. Terry watches him indifferently, never joining the play--if that is what it is. (Later he developed the same habit)

July 11th.

Terry continues to be the gentle, less active bird. He is more keen on trying to pull off the buttons on my clothes.

Archie is still the larger bird in appearance, and today, demonstrated that he is quite an accomplished and easy flier within the limitations of the cages C and B, flying with little appearance of effort even around corners, and easily ascending to the greatest height that the cages afford: about 8 or 9 feet. These flights seem to be exploratory.

Terry flies little and with difficulty. He is much weaker than Archie. Archie handles a live mouse without difficulty, killing it easily. Terry's blows and slaps lack force. He has more of a struggle and does not make it a sporting episode.

On one of Rhody's returns both tried to get out to him. R posed for them just as with the magpies.

R at close quarters, especially in a slanting sun, is really a beautiful bird with his blue, green, bronze, copper, black, white and tawny plumage and red, white and blue patch back of his eyes. He seems to have been recently refurbished. In a "spread-eagle" pose on the ground today, lasting for perhaps ten minutes, he was really a splendid creature. The two youngsters stared at him in admiration fixedly.

R, I should say, is one third larger in all linear dimensions than his offspring. (Theoretically this would make him about $2\frac{1}{2}$ times as heavy). When he came to me for meat the last time today, he used a new note, almost a chirp--the first time heard.

July 12th.

B sub-singing. Brownie seems to have initiated a cycle of sub-song; at least as I sat in the R.R. cage this morning, he sang thus continuously for a long time. It is the first for some weeks.

B moulting. He is getting a new suit of clothes and looks somewhat mangy. He is sprouting new tail feathers.

When Rhody arrived at the cage for meat, Terry emitted a loud, adult rattle-boo, but did nothing about it. (9:30 A.M.).

Age of A and T.

The young road-runners are now six weeks old (plus or minus two days).

Eye patch.

The coloration of the eye patches on both is the same. It ranges from deep, dark blue over the eye, through turquoise into white and then to ^{purplish} apricot. The latter was last noted as saffron, but it is now warmer. There is very little pure white, unlike Rhody's patches. (Colors not referred to any chart).

Feeding.

A and T will not or can not feed themselves except on living things or small creatures recently killed but retaining their original forms. Even the latter they wish handed to them or wriggled about. They will not pick up meat for themselves or any of the food mixtures placed in dishes for them.

Rhody and young.

At 3:30 P.M. Rhody came running up to the cage swiftly while I was in it with the young birds within a foot or two. He boomed twice and concentrated all of his attention upon them, not looking at meat offered him or at me, though doubtless he saw everything. He trotted slowly back and forth along the wire, following them as they moved correspondingly, repeating a high-pitched, aspirated sort of kerk. (It is impossible to describe). Also a low, hoarse whank. There was something duckling-like in the former and goose-like in the latter. The young birds were but slightly curious and not concerned when he ran off with plumage displayed without getting his meat. I found him a few minutes later resting in the lower limbs of a tree. He stretched out his neck, opened his bill and whined, taking the meat offered hungrily.

The two sounds above were heard for the first time today. I doubt if he recognises the young birds as in any way connected with himself. His attitude toward them on this occasion seemed to be one of great curiosity mingled with caution and a certain amount of fear.

At 4:30 Rhody again came to the cage, looked at the young-

sters, gave his new aspirated call, got his meat and departed. At 5 P.M. he came again with the same talk, this time taking a mouse from me. Archie was on my shoulder and Terry in my lap; they merely looked at him. He left to sun and dust, with no apparent regrets.

July 13th.

and young.

has special
approach call
for them.

On each visit to the cage today of Rhody's it was noted that he announced his arrival by giving the soft kerk call--heard on no other occasions. This would seem to indicate that some especial significance or association now attaches to the cage that did not formerly exist. Since the only change that has occurred there since his first acquaintance with it is the introduction of his two offspring, it would seem--earlier comments to the contrary notwithstanding--that he does recognise, consciously or otherwise, some bond between them and himself.

Incidentally this call was listened to very carefully today and seems best represented by querh or kwerrh. It is musical in quality.

Scale calibration.

The scales on which the young road-runners were first weighed were calibrated over a range of about 4 lbs. by using measured quantities of water. While there are some irregularities, fair concordance is afforded by assigning a value of 29.0 grams to the ounce as indicated on them instead of the actual value of 28.35. On this basis the weights of the young R.Rs (P 995) on June 18th. would have been:

Archie.....	232 grams,
Terry	174 "

Terry's present
weight.

Terry was weighed today when he got on the scales voluntarily. He weighed 9 ounces, or 261 grams, a gain of exactly 50%. This is at the rate of about $3\frac{1}{2}$ grams per day only and seems small. Archie would not condescend to sit on the scales.

Dr. and Mrs. Grinnell were here today to see the young road-runners and discuss the condor situation.

July 14th.

Roundup of road-runners
and thrashers..

About 11 A.M. there was an informal, unprearranged roundup at the cage in which all participants acted of their own volition. I was inside handing meal worms to Terry. Archie was sitting on top of my head digesting a mouse and watching operations. Brownie, Nova, Roughneck and at least one of the second brood of this year hove in sight. B came for worms handed him through the wire, disregarding the presence of A and T. I thought if Rhody should come the family would be complete with the exception of Circe and possibly one young thrasher. He did come, with his new calls, and for a time all birds present were within a quadrant of 25 feet radius--an unusual gathering. I could not watch all of them at once, but B and N seemed to want Roughneck to go away, although their pressure was not insistent. The other young thrasher messed about in a berry bush for a time. Finally all thrashers went away quietly.

Rhody concentrated his attention upon his family, going on top of the cage to get a bird's-eye view and to get near Archie who had gone up there. R continued his fluting calls, but neither he nor A, though interested in each other, appeared excited. R went over to inspect the magpies and while there ceased his fluting. For three quarters of an hour all three roadrunners rested quietly in their respective places and R came down for meat, then wandered off after a drink and a good dusting.

Weights of young
road runners.

Archie finally condescended to sit quietly on the scales. He weighed exactly 12 of "its" ounces, or as calibrated:

Archie..... 348 grams

Terry..... 261 "

Difference 87 " , which is exactly the

same difference as existed between them at the first weighing-- a surprising result.

At first weighing T weighed 75% of A and has maintained that relationship, increasing 50% in weight against A's increase of 50 % also. However, A's increase was 116 grams against T's of 87. These notes record the impression that T has been overtaking A in growth, but such is not the case, as far as weight is concerned.

July 15th.

Rhody resumes
spring song.

During my absence Dr. Reynolds heard Rhody (or another R.R.) coo in Dimond Canyon. This morning he was heard cooing here about 7:30. He is now, 9:30 A.M., up to his spring-time courting stunt of cooing from the roof of this house, his voice coming out of the fireplace in this room. (At this time last year he was in jail, but his singing had ceased some time before his incarceration).

It would seem as if he wanted to take up house-keeping again.

10:05. R is now singing "in" the living room fire place. He sang at intervals all the morning.

July 16th. and 17th.

Rhody sang here occasionally on the 16th.

He visits the cage frequently, sometimes not taking food there, but never failing to play, or whatever it is, with the young birds on the other side of the wire, with posturings, honks, quirks and rattle-boos.

R refuses quail
eggs.

He was tested with two unhatched quail eggs which were infertile but fresh in odor, as determined by chipping the shells slightly. He would have nothing to do with them.

B sings sub-
song for long
periods.

Brownie, although looking as if his stuffing were coming out, indulges in undersong for long periods.

July 19th.

Rhody and youngsters.

I am unable to determine what underlies the outward attitude of these birds toward each other--or rather between R and

his brood. When Rhody poses outside the cage he looks and acts very fierce, making charges at the nearest chick, but stopping short of the wire. They use me as a sort of fortress from which to make sallies in his direction. They retreat before his rushes and appear frightened at the moment, but make no sound and may fall to pulling buttons and buckles about my clothes. He seems much more excited than they, yet if I show him a worm through the wire he subsides at once and takes it. Hostilities are suspended all around when I pass out worms. It looks like play.

R and eggs.

This morning the quail eggs, meat and a dead white mouse were put outside the wire to give Rhody his choice. but he merely looked at them during intervals in his evolutions and would touch none of them. But when he went away, I looked him up in the garden and offered him the same mouse, which he took readily from hand and gulped down after having limbered it up by beating on the ground in his usual manner.

July 20th. to 26th., incl.

A refuses quail Rhody refused the quail eggs for two more days; they were then eggs still.

given to the magpies who ate them greedily. His attitude toward

and young. the young road-runners remained unchanged.

R not singing. He was not heard to sing again during this period, but continued his frequent visits to the cage.

Young indifferent The young birds are no more interested in him than in other to R. birds, it seems, now.

Young disturbed They show exactly the same reaction to the voices of children by voices of children. in the distance as Rhody, becoming excited at once and running about the cage. In their case, it is certain that they have never had any disagreeable experiences connected with children.

Tail feathers I find that they can "shuffle" their two top, middle tail change position feathers, i.e.: either one may lie on top of the other entirely concealing it.

I have not seen them perform this operation, but have noticed that sometimes one feather is on top and sometimes the other.

Youngsters
getting "black"
inside their
mouths.

When Rhody opens his mouth he displays a black interior. The youngsters have been all pink inside their mouths, but beginning a few weeks ago, the tips of their tongues became black and this color is extending ^{toward} gradually ~~in~~ the roots and to other parts of their oral cavities. More noticeable in Archie.

July 27th. to 29th., incl.

Rhody continues his visits to the cage, still using his new calls.

Archie is developing a new call somewhat like Rhody's hroo. hroo. Not heard often.

They have the run of cages B and C during the daytime and are usually at the platform at the entrance waiting for me to show up, but, if not there, immediately hasten there on seeing me approach, stick their bills through the wire mesh, quiver their wings and ~~whine~~, buzz or ook. (They still have all of their baby talk). In order to get in without risking their escape, door J is arranged to operate from the outside (from in front of cage B). My procedure has been to walk to the front of B, wait until they come rushing in to get near me, then close the door. For a week or so this worked beautifully, but they are getting sophisticated and seem to know now that the only way I can get in is through door I, consequently they are inclined to wait there stubbornly. They evidently like human companionship, for they rush to the door excitedly, even when not hungry and either fly up to my shoulders when I enter or calm down and go ^{else} about their affairs quietly. I keep a chair on the platform and this is a favorite roosting place as it gets sun in the early morning and shade and a cool N.W. breeze in the afternoon. When I sit in the chair it is seldom that one or the other is not sitting on my shoulder prepared for a long stay. (Sometimes both, but A uses

me as a roost more than T).

B's singing.

There was much full song by Brownie beginning before 6 A.M.

and ending after 8. His sub-song was especially marked on the 29th.

Old phrases
reappearing.

and phrases like the cut-cut-ka-dah-cut of the hen and other familiar ones not heard for some time are reappearing. This is also true

His human
whistle-call.

of his full song. His whistle call for his mate followed by the kissing sound, previously recorded in these notes, is again being used and is indescribably human. It would deceive anybody not knowing the source. The strange part of it is that it is undoubtedly intended to summon his mate, for it does bring her. It is difficult to avoid the thought that there is more intelligence back of this performance than is generally ascribed to birds. On hearing it one unconsciously endows him with human traits and thinks of him as a little man.

B's moult.

B is now an awful sight. I thought he had reached the ultimate in shabbiness some time ago, but underestimated his capacity. To

Blame again.

enhance his present lack of pulchritude, he has now gone lame again, and hobbles about like a cripple and when at rest stands wabbling on one leg. I wonder what he has to sing about. He must be buoyed up by implicit faith in the future.

July 30th and 31st.

B sings.

B continues his early morning full song with occasional bursts during the day, not neglecting under-song. He is still lame.

Road-runners.

Rhody.

Rhody on the job as usual, but his roosting place unknown. He seems to view the youngsters with greater composure at present, but is still curious about them.

The youngsters.

The young birds are not changing much in appearance now, nor in behavior. However there are some changes to be noted, such as:

They drink very seldom compared with frequent former libations. But often accept water from a glass held out to them drinking freely.

(It is as if they did not recognise water without having their attention called to it).

The eye-patch colors are less brilliant than R's, but the white is becoming more distinct.

The rings about the pupils are now as distinct as Rhody's, but have little, if any, yellow cast.

The white, hairlike appendages on the feathers (Mesoptyles or neossoptyles) have all disappeared but one or two per bird.

Irides getting browner, but still differ from R's.

They no longer try to swallow a finger when taking it in their bills. No suction is felt. They try to "kill" it if hungry, otherwise hold it with feather-like touch, *or pull vigorously*.

Each has pretty definitely settled upon one favored roosting place prepared especially for him after noting his preferences. Arch sleeps on a piece of sacking disposed on a high shelf close to the wire mesh where he can see what is going on outside. Glass has been placed to screen him from prevailing winds. Terry sleeps on a wire mesh platform covered with a cloth. placed up under the roof on a pine branch suspended there.

Terry weighs 11 oz. or, corrected and converted: 319 grams. Archie avoids getting on the platform, although both of them like to pull the hand and see it quiver.

I have difficulty in photographing them as they want to climb up on my back and play with the release mechanism of the camera, or else "kill" my necktie or indulge in other liberties with my belongings.

Feeding is becoming more of a problem, as they refuse usually everything that is either not alive or else not recognisable as a complete animal, though dead.

A curious exception is that, after they have retired for the night and are comfortably stowed away in their bunks each of them will take from hand, very gently, a piece of meat which he has persistently refused during the day, and even rejected a few moments before when "out of bed."

They continue to kill yellow jackets, but often do not eat them as at first, letting them lie and dry up in the sun, perhaps to be eaten later. I think I saw Archie stung by one he had caught; (or perhaps bitten, as these creatures can bite-- one having been watched cutting a dead one in two on my knee) because Archie made all the movements of one who had been injured in the mouth: shaking his head, wiping his bill and finally running to me as if for comfort; also "tasting".

They are still persistent dusters. Archie startled me by landing on top of my bare head and dusting vigorously. This is no gentle performance and his claws are sharp and he had to use them to hold on with.

The sharp point of the decurved bill is a great assistance in killing an object by beating it upon the ground as it makes

their hold upon it certain; but it is a disadvantage when picking up small objects as it seems to interfere. It also sticks into small soft objects which they are attempting to swallow and causes them to remain impaled indefinitely there instead of slipping down the expectant gullets. This is especially true in the case of the small slugs that Terry occasionally catches, the sticky slime exuded by these creatures complicates matters. In attempting to wipe off the slime on the ground (or on me, if I am handy), Terry unintentionally adds small twigs, leaves, feathers and similar objects to the collection. More than once I have wiped it off for him when he was in difficulties.

August 1st. to 6th., incl.

Brownie recovers.

B was no longer lame on the 2nd.

B's moult.

He is still very shabby, but has a nice, new creamy throat-patch replacing the bare spot left by the departure of his old one. As observed with previous moults, his new suit is lighter in hue than his old one.

As usual, again, he sings through his moult, especially sub-song and seems very happy, though somewhat retiring.

Rhody.

This animal, much to the delight of the neighborhood, has fallen back into his old ways (excepting that he roosts at some unknown--though suspected--new location).

and young.

His interest in his off-spring varies in intensity--from indifference to a state of considerable excitement in which he boos, displays and charges at the wires separating them from him. Except possibly for the sounds reserved for their exclusive benefit, which he still uses occasionally, I can perceive no action on his part which clearly indicates any ^{greater} feeling of kinship toward them than toward the rail, for example. On their part, interest continues mild.

August 7th. and 8th.

"Weaning" young road-runners.

The young road-runners are so fond of mice that it has been difficult to make them eat anything else (except living things). By cutting down on the mouse offerings they are being gradually taught to eat other things. Hamburger steak, for instance. Terry is the more compliant of the two

B gets a surprise. Poor Brownie has suffered a great indignity, having wandered

into a trap set by Julio for rabbits, where I found him very much disturbed, acting like "any other" bird under similar conditions. When released he departed promptly, but I followed him up and offered worms in apology, whereupon he decided to forget this transgression upon his personal liberties. This is his first experience of restraint. This also ends trapping here.

August 9th. to 12th., incl

Thrashers relaxing territorial claims.

Thrashers seem to be insisting less at this time of the year in maintaining territorial rights; frequently a third or a fourth bird is seen more or less in company with B and N. with no evidence of serious conflict. As a corollary, they seem to be wandering more, though B and N continue to make this place headquarters. The pair at Mr. Sampson's is still there or thereabouts, and two thrashers are again making free of the cage at Dr. Reynolds', going in and out with little fear of human spectators. It would seem that thrashers remain paired indefinitely.

Archie's bill damage.

Archie has damaged the decurved tip of his bill in such a way that there is no longer complete closure at the point, the tip being bent upward so that it forms an extension in continuation of the main axis of the upper mandible instead of being at right angles to it. The effect of this is very noticeable; A has difficulty in handling mice and pellets of meat in the killing or breaking up operation, as the case may be, owing to his inability to maintain his hold upon the object. Also he frequently has to make 8 or 10 attempts at seizing his prey before succeeding.

Along the line where the maximum deformation has occurred the bill has "crippled" and an incipient crack extends across it. It will be interesting to observe how the damage is repaired, if it is. Sketch below shows "before" and "after".

These are not to scale, but are about life size. In the young birds, A and T, the hook does not project below the lower mandible, but in Rhody it does, thus:

August 13th. to 16th., incl.

During this period Archie's bill has become progressively worse and it looks as if the tip would come off entirely. I got a glimpse at it from the inside and a crack extends all the way across there also.

He can not now manage a full grown, live mouse, but very young ones are still within his capacity.

This injury has made him much less domineering in his attitude toward T, although he never has been really disagreeable about it. Terry seems to realize that a change has taken place and defers to A less, in fact on one occasion when A became too curious about a mouse that T was handling, T gave him a good peck, hard enough to make Archie cry out and run away without attempting to retaliate.

Road-runners are not eaters of carrion. All three road-runners are particular about the freshness of their food. Two large mice were killed about 24 hours ago. Neither Archie nor Terry had been able to manage them while living. Archie could not handle his even when dead and Terry rejected his after several trials. They were offered to the youngsters several times during the 24 hour period but were refused notwithstanding that both birds, during that time, accepted smaller mice, both living and freshly killed. At about 4 P.M. on the 16th. one was offered to Rhody, who promptly took it from hand, beat it upon the ground, but rejected it after he had almost completely swallowed it. He stood looking at it for several minutes, but not touching it, and wiped his bill frequently on the ground and "tasted".

When I offered him the second one, holding it just above some meat in a dish, he came and took it promptly in preference to the meat, but finally rejected it as he did the first, then came and took the meat, finally walking off and leaving the mice lying on the ground. Neither mouse could, perhaps, properly be called carrion, though they were undoubtedly stale, no attempt purposely having been made to keep them fresh. Previous to this Rhody had been tested on dead mice kept for several days at a low temperature and he had not refused them at any time.

August 17th.

Archie's bill. During the day the tip of Archie's bill gradually worked looser and by 5 P.M. had turned up almost at right angles to the upper mandible, standing up like the horn of a rhinoceros. He was unable to handle even a small mouse unless it had been previously stunned. However, he could catch flies and yellow-jackets, sow bugs and one centipede. The horny part is cracked all the way around and all that seems to be holding it on is some sort of tissue between the "roof" inside and the horny envelope. I expect this tip to break off very soon. I suppose it is living tissue and will be replaced somehow.

August 18th.

At 8:30 A.M. it was noted that the tip had come entirely off of Archie's bill. It could not be found. The bill at present (9:30 A.M.) looks as below:

The small, pointed projection from the "core" of the upper mandible, shown above, looks like the tip of his tongue, but it is not. It is of a greyish, neutral color and seems to be free of the horny portion at the point of emergence.

10:30 A.M. Brownie has been very vocal since before sunrise, singing full song frequently and calling other thrashers. He has

assembled at present, Nova and two others, all apparently in amicable relationship.

Part of his calling consisted of his whistle-kiss song with the kissing portion very loud. Nova answered this with a similar, softer whistle, but without the kiss, and with occasional bursts of her highly individualistic, high-pitched full song. She was watched approaching from the east, followed by another thrasher that was fully grown. A fourth thrasher was also making himself heard a hundred feet or so away toward the south west.

These notes recorded a gathering season of thrashers some time last year, when they grouped themselves at various points and sang simultaneously, and were, in fact,, pretty noisy at times. This looks like the beginning of a similar epoch, but I have not looked over earlier notes to compare dates. as yet. The relaxation of territorial claims referred to in the Aug.9 to 12 notes, is perhaps connected with this tendency to get together at the present time.

8 P.M. I have just looked up last year's notes and find that the concentration of thrashers now being noted exactly parallels experience of last year almost precisely to the exact day of the month. This is curious. Perhaps even more interesting is the fact that two thrashers have begun to use Dr. Reynolds' aviary again just as Pat and Neo did last year at this time when released. (See note of Aug.9 last year recording release of these two birds which marked the beginning of their going in and out of the aviary, and note of Aug. 9 to 12 this year stating:" Two thrashers are again making free of the cage at Dr. Reynolds.....". Possibly they are Pat and Neo returned!). They were doing it today, also and Dr. Reynolds says that it is a regular performance now.

In looking over notes of this time last year, I find frequent references to Brownie's use of his night roost during the day at that time. I had forgotten this and have not thought to see whether

he is doing it now or not.

10.25

Archie and his
bill.

It is quite apparent that A gets along much better without the tip than with it in its misplaced condition. He picks up things --or attempts to, with greater confidence, although he was absolutely unable to pick up a meal-worm from a flat board this morning. If it is on loose earth he can do it. He is now able to handle a small live mouse pretty well, although it is noted that he does not kill it "entirely", but swallows it still living as if fearing to lose it. Terry has always been very careful to beat the mouse to a stage of complete limpness long after it is dead and maintains that practice.

Effect of reducing
mouse supply.

Reducing the number of mice fed is working out well and the young thrashers are making up the deficiency^{ci} by eating meat. They prefer to have the meat sun-scorched on the outside and almost black. This insures freedom from slipperiness and makes it unnecessary for them to wipe their bills so thoroughly as when it is moist, (as if trying to get rid of an objectionable taste or, perhaps, de-

Prefer that
meat be dry
outside.

Increased
drinking.

posit) It is noted, however, that they drink much more water now that they have fewer mice, lending support to conclusions reached tentatively from earlier observations that a diet of mice (or living things) furnishes a considerable portion of the moisture needed by them.

Condition of
young Rrs.

Except for Archie's bill, I would say that both birds are in fine condition. They are so tame and confiding that they permit one to feel of their bodies to see how fat they are, and they feel plump and hard. They are lively and interested in everything, catch numerous insects, carry things about, like to play with twigs and small object offered them and tug at them manfully, "help" me dig in the ground with sticks and seem to have a real fondness for human beings even apart from their recognition of them as purveyors of food. Perhaps they like them best as high perches from which they

Attitude to-
ward man.

can view the surroundings and preen. Also men have numerous buttons, straps and pockets to be examined and worked upon and have the happy faculty of locating themselves as to sun, breeze or shade in a manner eminently satisfactory to road-runners. Their shoes, necks and hair are good to wipe bills on and they make fine landing and take-off eminences; besides this they turn over rocks and disclose many interesting crawling things, hand out water in glasses saving the trouble of going to the pool and serve a final snack to sleepy youngsters after they have gone to bed for the night. Altogether rather pleasant animals to have around, men.

A and T 79 days old. Archie and Terry are now 79 days old, plus or minus 2 days. While Archie is still the larger bird, and it looks as if he would always be, the physical disparities between them in other respects have virtually disappeared. They are equally active and light in flight and have the same limitations and abilities.

Deceptive appearance of size at distance. Curiously (like the thrashers) they look larger the farther they are away. An illusion, no doubt, for which the bird is not responsible. Nevertheless, whichever it may be, the nearer bird always seem to be smaller at the moment. Perhaps it is the same effect that makes the moon look larger on the horizon than it does when overhead, (although it actually is fractionally smaller in angular diameter on the horizon).

Mammal-like actions and sounds. Again, curiously, these youngsters seem more like little animals, i.e.: mammals, than birds in their actions in an illusive sort of way hard to describe. Perhaps it is in their various utterances which, beside the rattle-boos and a soft dove-like hroo (which Terry now has also) consists in wahks, oohs, grunts like little pigs, mews like kittens, whines like puppies and a curious bleating ma-a-a like lambs. Besides these mammal-like sounds there are others such as quokh; a strange popping not made by the bill; a peculiar thin, harsh buzz of high frequency which is also sometimes punctuated by hollow, resonant pops of entirely different pitch, much lower

The buzz and buzz-pop. and distinctly separated from each other in time. This buzz (and the buzz-pop) is made with spread and quivering wings while the youngster is running toward me, low to the ground and circling about my feet occasionally pecking at them impatiently as if wanting some kind of action on my part. Off-hand one would say that it is clearly a call for food. Perhaps it is sometimes; certainly it is not always. I think it seldom is, and that it is really a demand for attention, for if the bird then flies up to my shoulder as it frequently does, the buzz ceases instantly and is followed by little animal sounds perhaps expressive of affection or contentment. Or if I reach down and pick it up bodily it may subside once with the same gentle sounds or, in marked contrast, snarl nastily like a cat, struggle to get free and either run off or else jump up on me and settle down contentedly immediately notwithstanding the explosion of temperament at the instant it was caught. (It makes this same angry snarl when stepped on by its brother--or sister). This snarl may be described as a disagreeable, nasal raowh or waowh, the a being short. On hearing it, the cause of it might reasonably expect to have a fight on his hands, yet in three seconds or less the bird may be sitting on his shoulder placidly preening.

Vocal recognition of friends. When flying up to a perch these birds are silent; yet when alighting on a human being they always announce their coming and arrival vocally by pleasant sounds. In other words: the inanimate object is not classed as something to be communicated with, but the human friend is. It appears to me, then, that ~~the~~ ^{these} sounds are perhaps nothing specific and intended to convey some message, perhaps not consciously, but at least they indicate some recognition on the part of the bird of a friendly fellow creature possessing some measure of understanding and capable of responsive action. (I suppose this point of view represents naive anthropomorphism and that all this is readily explained by a simple, elementary pattern which the bird is constrained

Meaning(?).

Reaction to handling.

Speculation in talk.

Anthropomorphism (?).

ed to follow--willy-nilly--by immutable laws ordained at a time when chaos was beginning to show the first hopeful signs of possible convertibility into ~~into~~ an elementary precursor of cosmos. However this may be, I get more fun out of it by regarding the birds as little people of whom to make friends. These notes record certain indubitable (within human limitations) ^{physical} facts which can easily be sifted out of the amateurish speculations also contained in them by any competent biologist--if worth while--so that there is no danger of overthrowing established knowledge by the appearance herein of ingenuous heresies).

August 19th.

's bill. The small, thin projection from the "core" of Archie's bill is getting shorter, larger in diameter and more rounded. There seems to be no infection present.

Effect on Terry of A's injury. Perhaps to be expected, but worth noticing, is Terry's increased air of confidence in his dealings with A since the mishap. T no longer defers to the larger bird, in fact, is now slightly the aggressor. Since the tip came off I have seen him go up to Archie three times and deliberately touch the end of the sore bill -- not ungently. On these occasions A has retreated. He has also several times avoided T's approach. T today, also, stole two mice from Archie, A submitting tamely. Formerly the reverse action was the rule.

Mutual effect. There seems to be also a tendency toward interchange of the attitude of the two birds toward things in general. Thus Terry is now the ^{more} active, inquisitive and assertive bird; Archie's trend being in the other direction, he has become more friendly and mild, if anything. However, A's technique in handling live mice is improving.

Reversal of roles. There seems to be also a tendency toward interchange of the attitude of the two birds toward things in general. Thus Terry is now the ^{more} active, inquisitive and assertive bird; Archie's trend being in the other direction, he has become more friendly and mild, if anything. However, A's technique in handling live mice is improving.

Weights. The household scales have proved unreliable on account of excessive friction's rendering the zero point variable to the ex-

tent of as much as two ounces. Also Archie does not like them, T, on the otherhand, considering them ^a delightful sources of amusement. About the most that can be said is, that insofar as these scales are concerned, there appears to have been no certain change in the weight of either bird, one way or the other, since previous weighing. Repeated weighings on Terry today, "judgmentally averaged", gave 11 oz., the same as on July 31st. (319 gms). At that time Archie was "unweighable". One very unreliable one on Archie today might be interpreted as being 14oz., or equivalent on these scales to 406 grams. This gives a difference between them of 87 grams. Looking back to page 1009, I find it is identical with the figure at that time. This, however, can only be ascribed to accident, although the relative weights of the two birds may be fairly correctly indicated. In any case, this weighing tends to confirm visual conclusion that there has been little growth of these birds in the last few weeks.

Terry "barks". With Archie sitting on top of my hat and Terry on my shoulder, the latter espied somebody approaching ^(Julia) a hundred feet away and suddenly emitted a loud, strikingly dog-like sound evidently intended to be heard at a distance: ^{half} Not. 10th. Not yet repeated

Wuh, Woo-o-o-h! July 31, 1936 ^{Never}

The first sound like this heard from any road-runner here, and to date, the one and only.

August 20th.

Reaction of Rrs. to human voice. It was noted herein in the beginning of my experience with the two young road-runners that they, more especially Terry, reacted in a peculiar way to the sound of the human voice when spoken to in an otherwise silent period and when ^{they} themselves, were in repose, more or less. The reaction consisted in shaking the head sidewise once or twice with short, quick movement and then stopping only to repeat when again addressed. Experiment showed

that responses were almost invariably obtained under the conditions stated over distances amount^{ing} to from a few inches to over 20 feet. Terry was far more sensitive than A. This condition still persists, but beginning some weeks ago, Terry began to amplify his response by stretching out his neck, opening his mouth wide and shaking his head as if trying to expel some undesirable obstruction or object from his throat. At times this action has persisted for perhaps as much as ten seconds after being started and occasionally has thereafter been repeated several times immediately following the first effort without having again been spoken to in the meantime. At first it seemed to me that it represented merely a nervous start at an unexpected sound, but later it app^aered as if the human voice produced an actual physical effect upon the bird's throat or some mechanism or process in it. It was soon noted that response ~~seemed to be~~ ^{the} was more certain with low tones than with high^T and this naturally suggested that it might be a resonance effect in the bird's syrinx in which that organ responds to vibrations of the human voice of selected frequencies with sufficient intensity to cause a certain feeling of local irritation. This does not seem at all impossible when we recall the experience which, I suppose most of us have had, of feeling in ones back the vibrations of the voice of a person whose back was against the same object, such, for example as the back of a hard bench. Once or twice I have persisted in repeating Terry's name to him when he might be sitting anywhere--on my back, head or 20 feet away, and have had him show what certainly looked like acute discomfort. I have had him thus, when sitting on my shoulder, shake small particles of saliva (I suppose) out on to my face.

It will be seen that there are a number of interesting lines of inter-possible relationships hinging upon this observation which might

be well worth while running down, but these are only notes and I

+ See notes of

am only playing with the birds. However, off hand, it will be study of the effect of better seen that, the personal characteristics, (or what might be called the personal constants) of the particular bird and the particular man concerned, such as pitch of voices for example, might lead to some curious disclosures. One can imagine bird A responding only to man A, but bird B not being affected by him, or by women only, etc, etc in infinite permutations and combinations.

Brownie's siestas. I had forgotten to check up on Brownie's habit, noted last year during thrasher convention season, of retiring to his night roost for longish periods at odd times during the day to recover from the nervous strain incident to his activities as head of the reception committee for this territory. (Or perhaps it was to think over his next speech or reflect upon the new ideas just received from delegates, or prepare a political coup). I thought of it today and when about 11 A.M. I heard him call melodiously:



B follows last year's pattern. Purple, one two three. trrr.trrr.trrr. European, European.

and then subside. I went out to look. Sure enough, there he was comfortably ensconced in his old night roost in the dormitory tree sitting under his roof over the nest site behind the screen. He was not interested in me at all, or anything else outside his retreat. All he wanted was to be left alone to think it over or snooze, whichever he elected.

A phrase of B's last Brownie has a phrase heard first, year and again this, which unrecorded. I think I have not recorded as yet, and which is often heard:

Pa-teet, woo-ay-verr. pa-teet, woo-ay-ver.

(The ay as in hay). I think it can be recognised by anyone from this description, as he says it rather plainly.

The Road-runner's In looking at a colored picture of the yellow-billed cuckoo showing its tail from below, in Birds of Minnesota (?)

at Dr. Reynolds' day before yesterday, I was immediately struck with the identity of the pattern of the white spots on the tails of our road-runner and the ^{middle-western} bird illustrated, both having the same number of spots, six, arranged in two parallel rows of three (when the tail is closed), the rows arranged longitudinally. The spots on both are also of the same shape, ^{roughly} elliptical, and appear to have areas bearing about the same proportions to the tails of the respective birds, being also large and conspicuous.

August 21st.

Rrs do not digest fur.

It has now been observed several times that the dried excrement of these birds has appeared curiously felted. Examination has shown in each instance that it is due to the presence of the fur of the mice eaten passing through the digestive tract apparently unchanged and acting as a binder. (I.e.: of the other material). Owing to the occurrence of a large proportion of lime from the bony framework of the mice also, the resultant product, when perfectly dry, is strikingly like the plaster mixed with hair used in building. This is the first evidence here ~~mk~~ that any portion of the food was indigestible. The miscellaneous assortment of pebbles, fibres, etc. occasionally disgorged by A and T in their infancy was not a portion of their food. but consisted of "junk" which they picked up presumably either as grindstones and abrasive material or in ignorance as to what properly constituted food. Possibly. also. an indication of improper feeding. This habit disappeared weeks ago. The disgorging act was observed perhaps a half dozen times altogether. although many times they have acted as if they were trying to disgorge something. This has been observed with Rhody also.

Thrasher convention. This morning there was a "great convention" of thrashers again. Five or 6 birds were here, 5 being actually seen simultaneously, and a babel of song. The birds were at the south west corner first, then part of them (including Brownie) went across the street.



TERRY
(About Aug.20,1935)

Preening. The movement of his head was too fast for the shutter-speed used.



RHODY
(About Aug.20, 1935)

Performing a "spread-eagle sun-fit" but keeping an eye upon passing events.

walked about the roofs of the houses. flew up to the chimneys and the trees singing vociferously. Brownie could be easily distinguished from the others by his well-known phrases. They behaved more like mocking birds than like any thrashers I have noticed before. There was no evident chasing, although there was some stiff-legged walking by one bird along the ridge of a roof in the presence of another bird. One of the birds left behind took up position in a tree overhead and sang with tremendous power for several minutes, intermittently. All of its phrases were unfamiliar. It finally joined the others. After a half hour or so everything became quiet and I went in search of B to see if he had returned to one of his night roost to calm down. However, he was at the oval lawn, very meal-calm and ready for worms. Incidentally he also got very large cut-worms from the lawn--- a valuable service.

Whether all this is a territorial act (B inducing other thrashers to go elsewhere and arguing about boundaries) I do not know. Perhaps it has something to do with the young birds of the year or what-not.

Archie

Archie's new tongue
habit.

Since now has no decurved tip on his bill, but a nice hole that he could blow through like a pipe. (if he can blow) he has discovered that he can run his slender, black tongue out through it like a snake or a humming-bird and frequently performs this un-roadrunner-like stunt. It looks as if he had a weakness corresponding to the human one of putting the tongue in the vacant space left by a departed tooth. (More anthropomorphism; but what pattern furnishes an alternative?)

Bhody. today. taking meal-worms from hand one at a time. accepted each one patiently and readily until the last one. This one was so small that it had hidden to the last in the bran. It was about the size of one of R's eyelashes. Instead of taking it at once as he had each of the others, he looked up into my face as if to ask

assure himself that I really intended that he should eat the miserable creature, then took it dutifully. What was the pattern here?

August 22nd.

No thrasher
convention.

No thrasher convention seen at or heard from this place today. B and Nova (presumably) were frequently seen quietly attending to their usual affairs.

August 23rd.

Convention.
at R's.

No convention seen or heard here, but one heard in the distance. Dr. Reynolds says there was one at his place this morning.

B sings in
roost.

At 5 P.M. soft song was heard from the dorm. B was in his night roost and nesting site there. Last year this action preceded the building of a nest there. (Think Sept.).

First Road-runner
pellet.

At last an unmistakeable pellet has been found disgorged by one of the young road-runners today. It seems to be entirely composed of mouse hair, but will be examined more in detail. The event is so rare with the birds under observation that it must still be held that the evidence to date is that road-runners do not make regular a practice of disgorging those portions of their food usually classed as indigestible.

August 24th.

Another pellet.

Well! Another pellet found this morning. The first one, dispersed in water, contained only mouse hair as viewed by the naked eye. The second one contained fragments of two teeth. The surface of the water looked oily.

A thrasher
chase.

At about 9 A.M. a thrasher was seen running swiftly along the lower road, dodging into the bushes when it saw me. In a few moments Brownie emerged in pursuit. He halted when spoken to and came for meal worms. The matter did not appear urgent. Possibly this means, taken in connection with B's renewed sitting in the dormitory, an awakening of B's reproductive instinct. It is about time for some show of late nesting activity as in previous years.

Meaning?

A and T not afraid In the afternoon the young road-runners were perfectly self-possessed in the presence of two visitors whom they had never seen before: E.D. and John Cushing, students at the University. Cushing went inside and Terry made friends with him at once; Archie was more standoffish. Terry, in play with Cushing, indulged in the longest and most strenuous biting and pulling match I have seen either of these birds exhibit.

pulling
match.

Rhody unusually Rhody, after hanging back for a time and watching from a distance, finally came forward boldly and joined our group of three outside visitors.

also unusually
attent upon
youngsters.

the cage and stayed a long time with his attention concentrated more and longer on the youngsters than I have seen before. He remained standing quietly most of the time watching them keenly and, when tired standing, lay down and continued his watch. There was something almost pathetic about it.

August 25th.

Though B sang a little in the early morning, the real thrasher convention seem to have been over at Reynolds'.

Dr. Miller
visits Mrs.

Dr Alden Miller came in the forenoon to see the young road-runners. They made friends with him at once, at least Terry did, but Archie was a little slower although not frightened and eventually accepted him. We watched the interest shown by A and T in the gopher snake. They did not offer to attack it but were curious about it, approaching within about a foot, displaying mildly.

rs mildly
interested in
snake.

A and T badly
frightened.

While Dr. Miller, Dr. Reynolds and I were examining the "ailérons" of R's screech owl about a hundred feet from the cage, K.D., whom the birds know well and climb all over, Mrs. Reynolds and her sister approached the cage. The young birds flew into a panic instantly. Archie cut his forehead and throat and lost one tail feather; Terry cut his forehead badly and his chin and broke three tail feathers so that they stand out at right angles. When the two ladies retreated on observing the panic and told me about

Injure them-
selves.

TERRY (right) watches
Alden Miller's digging
operations. Aug. 25th.,
1935.
Age about 9 weeks.



ARCHIE (left) exhibits
the "spread-eagle" method
of sun-bathing. Age about
9 weeks.

Fear extends to me. Reaction to owl. Speculation as to cause. Reaction to red roses. Previously noted reactions. Red under suspicion. But fear probably due to variety of causes. Surprise shower.

it, I went to the cage and inside, but they were then afraid of me. Later when they had calmed down they were shown the screech owl and exhibited considerable curiosity about it mixed with some nervousness.

3:06 P.M. This incident has puzzled me greatly, as will be shown later, but in thinking of the reactions of these birds toward various persons, and recalling the bright colors of the dresses, color seemed to me to be a possible explanation. So just now I picked two bright red roses (Hoosier Beauties), put them behind my back before coming in sight of the cage. A and T were sitting together on the back of the chair on the platform quietly watching me approach. I went up to about 3 feet from them and slowly produced the roses; they immediately flew into a panic and retreated into the next cage. Each time I showed the roses they retreated. I did not push the test further for fear of alarming them unduly.

It has been frequently noted herein that these birds (and Rhody) become uneasy on hearing the voices of children even as far away as 200 yards and the first thought was, naturally, that it might be that they are afraid of women's voices, but they have frequently tolerated the presence of women on other occasions. When they were, perhaps too young, they showed no fear of Mrs. Reynolds and her sister. Later only a little initial nervousness in the presence of Mrs. Reynolds and the same with relatives of mine of the same sex. In the present group there was one red sweater and a skirt checked in black and yellow. At the moment red is under suspicion. Rhody, as well as these birds, has shown fear in the presence of women, strangers, children and numbers, i.e.: groups of persons. All of them show some fear of an object, such as a chair or a coat being carried and it seems probable that a combination of the various factors above caused the panic. At least this will have to do for the present.

A brisk, "surprise" shower fell in the forenoon for a few min-

utes; not entirely unknown at this time of the year, but not to be expected.

August 26th.

A little rain during the night.

B singing in rain. At 5:30 A.M. it was raining gently. Brownie was singing at that time.

B fails to assemble convention? At 9 A.M. Brownie was singing from an acacia at the road-runner cage, being answered by Nova in the old oak, whose song is so distinctive that it is unnecessary to see the bird to identify her. It is still like that of no other thrasher I have heard. Again I am strengthened in the belief that Greenie was a very young bird and learned her phrases from Brownie. Brownie's present object, since he would pay no attention to me at all and other thrashers were heard singing in the distance, seemed to be to summon another congress. But in this he failed, if that was his object. On the other hand, however, he may have been merely announcing that his territory is occupied. This is not news to Nova and I doubt if B is contemplating a divorce. After a half hour, B decided to come for worms and then joined Nova.

Magpies object to clipping T's tail. In the meantime I had cut off Terry's three broken tail feathers which were dragging on the ground. A simple operation with him as all I had to do was to hold out ^{an} arm in a convenient place for me to snip and "go to it". Terry did not object, but the magpies, made it their business to screech raucously as each feather fell from the shears--true to form. For a short time after that if I ^{merely} showed them the shears and snipped them I was greeted with a chorus of yells at each performance.

Heavy rain. 10:45. Heavy fall of rain for the last 15 minutes. I will see how A and T like an umbrella. Rains and umbrellas are phenomena beyond their present experience.

A and T and Umbrella. 11:15. I remained outside the cage with the umbrella. Neither

bird showed any fear reaction, but if I had gone inside with it, doubtless they would have been frightened as they are of all strange objects introduced into their immediate presence unceremoniously.

A and T's first Archie was in cage B (p.1003) under cover, but pretty wet as to rain.

outside. Terry was in the open in cage C, but dry except as to tail.

R comes. I gave him meal-worms there and Rhody appeared from nowhere to get his share handed through the wire mesh. He was fairly dry, but with spiky wet tail. His meat had already been washed white in the rain and he did not take it after inspecting it. (These birds appear to have some color sense and base action upon it).(?).

Archie learns quickly where meal worms are. Archie saw what was going on, divined the real source of the worm supply, jumped upon my knee and helped himself from the box direct, although the worms were concealed in the bran. This is only the second time that he has seen inside the box. On the first occasion he ~~must have~~ learned that it contained worms from personal experience. On the second occasion, as staed^t, he went direct to worm headquarters on his own initiative. After the worms were gone, he remained on my knee wringing out his feathers and oiling himself.

A and T compared. It appears that Archie was slower in taking the necessary steps to avoid a wetting than Terry. Terry, however, has not yet apparently formed the same associations with the worm box, though he has had the same opportunities.

R refuses some meat in situ, but accepts it from me. About noon Rhody came again and looked at the "white" meat. turned from it and began searching for sundried scraps which he ate. then went away. I got the meat which he had just refused, squeezed it reasonably dry so that it regained some of its original color. looked Rhody up, called his attention to the "new" meat and he came and took it readily enough, gulping it down by my side instead of running off with it as he usually does. The slight change in color probably had little if anything to do with his changed attitude toward the meat; the determining factor probably being his association of me with acceptable food.

A warm rain

1:15 P.M. Still raining--a very warm rain. (Temp. 67).

Indoor temperature 72. Due to greater humidity outside, the sensation immediately on stepping out of doors is one of greater warmth, and on coming inside, it feels slightly chilly. Yet it is 5 degrees warmer inside. The difference feels more than that in the opposite direction.

oil gland.

These three road-runners have what appear to be extremely small oil (or preen) glands for the size of the bird, suggesting that they are adapted for a climate where little oil is needed for the feathers, and this, I suppose, means arid conditions. The road-runner is, of course, most frequently found in arid regions.

Use of oil gland. I have had many opportunities to watch the birds use this gland at short range. One such occasion was when Archie decided to take up a permanent residence on my knee this morning. He would nibble the nipple, beginning near the tip of his bill working toward the gape. The little bead of oil which was left at the nipple was usually wiped off on his cheek and ear coverts and then applied to his plumage wherever deemed necessary. He did not object to my removing the drop with a finger.

Repetition of color test.

Disturbing factors.

Red avoided.

Indifferent.

Shiest.

About 3 P.M. I made another rough test of the young birds' reaction to the same red roses. This proved somewhat abortive as Rhody took it upon himself to come to the cage at the same time, causing a mild amount of excitement, and a nearby bon-fire began to crackle fiercely simultaneously arousing a certain amount of fear in the youngsters. It was noted, however, that while they showed nothing like a panic, there was avoidance of the immediate vicinity of the flowers and they kept away from me as long as I held them. Rhody, on the other hand, did not hesitate to take food from me under the same conditions. Terry was the shy one. It was he who incurred the most damage yesterday. The flowers (including some scarlet penstemons) were placed at points usually most frequently

quented by A and T, Rhody, the opportunist, having gone again. Terry quite definitely avoided them and once, in coming unexpectedly upon a fallen rose petal, leaped straight up into the air in alarm. Archie, on the other hand, on seeing one fall to the ground, ran over and picked it up. Terry gradually became more tolerant of their presence, though once he leaped over petals in order to avoid them.

The young road-runners, although I should not call them timid birds, are extremely sensitive to their surroundings. They are, necessarily, encountering a succession of new situations entirely beyond their previous experience. Some of these must be startling. When it was noted that, allowing for the disturbing factors mentioned, they were not greatly alarmed on second sight of the roses, although avoiding them, my first thought was that it makes a difference who has the red--a trusted friend--or a stranger. Doubtless this is true to a certain extent. When I showed them to them yesterday and they were frightened, they perhaps associated red with the bad time they had had shortly before, being still nervous. ^{still} Today yesterday's experience perhaps had little effect.

Without the evidence all being in, it would seem that their great panic was due to some such combination of causes as: (1) The presence of many persons moving about, some of them unseen: (2) High voices (like childrens') near at hand emanating from a group near them containing strangers showing assertive colors in large masses never seen before and moving too rapidly toward them, one of the colors, red, being especially distasteful.

In this connection it will be recalled that Rhody bolted whenever he caught sight of Miss Dougan with her camera even at a distance, so (3) perhaps moving skirts.

Archie learns
more.

Archie's discovery that the worm box is the true Santa Claus has modified his tactics with me. After this great event he persisted for a time in jumping into my lap and staying there (instead of to my head or shoulder as usual) and scrutinizing my topography for the box. When shown it with the cover still on he now taps the cover with his bill apparently knowing that worms are or should be inside. He appears to learn quickly.

Several friends whom A and T both know and are familiar with have remarked that it is Terry that comes to them and climbs all over them most; that Archie is more offish. I have noted the same thing in his attitude toward them, but curiously enough, with me he is, if anything, more confiding than Terry. At any rate he is usually the first to come and he takes possession of me for longer periods.

August 27th.

Terry losing
tip of bill?

At 9 A.M. it was noted that the tip of Terry's bill, suspected of being slightly parted yesterday, actually is so, and that there is a slight, although easily seen, depression running transversely in exactly the same relative position as Archie's final fracture. It looks, therefore, like the beginning of a similar affair. If T's bill does break off it will raise the point very definitely as to whether this may not be normal procedure with road-runners, the juvenile hook being replaced by an adult one. (Perhaps it was damaged in the panic of the (25th.).

A's bill.

Archie's upper mandible seems to have grown out somewhat. The difference in length of the two mandibles is almost certainly less. He now shows little disability due to the loss of the tip.

Rose reaction.

Both birds now run over the rose petals (which are still bright) indifferently. The scarlet penstemon is placed where they often thrust their bills almost into it. They are not bothered by it. There seems to be no constitutional antipathy to redness per se.

The Rain

Yesterday's rain from official Weather Bureau reports in this morning's papers actually was "unusual".

It was the ninth August rain in Oakland in 61 years.

" " " second heaviest in " " 40 "

It is expected to exceed the total rainfall in any month of August in S.F. in.....85 ".

Last 24 hrs. precipitation in S.F..... 0.25 inches

Total normal for month of August 0.03

Max. total for entire month of Aug. in 85

years..... 0.29

August 28th.

11 A.M. Cloudy, threatening rain again!

The usual early morning thrasher songs wandering about; B one of the performers.

Effect of the Voices of Children

A and T grow
nervous without
perceptible
cause.

While in the road-runner cage shortly before 10 A.M., it was noticed that A and T were beginning to get restless, flying back and forth, up and down and leap-frogging off of me, T being the more disturbed. A would take worms offered but T would not. I was puzzled, since there was no visible cause. The atmospheric conditions made distant sounds more distinct than usual, and I listened intently.

Voices of
children.

Soon I was able to hear the voices of children at play (in the school-yards presumably). There is no school nearer this place than perhaps 500 yards or even more. By walking about the grounds I was able to determine the approximate sources of the sounds. On returning to the cage, conditions there were found even more aggravated. Soon children's voices were heard about 200 yards to the N.W. playing about a house under construction. When the distant voices were no longer heard (the children probably having gone into their school-rooms) restlessness declined, even though the nearer children could be heard at intervals. (Not being at school?). When these voices ceased, Terry began to accept worms and sit comfortably on my hand. During the period of excitement I wondered where

Distance.

Rhody comes. Rhody was keeping himself, and whether he was trying to escape the all-pervading--though not loud--clamor. Perhaps as a coincidence only, he appeared at the cage just as the calm period began, though I suppose he must have been annoyed by the preceding sounds.

Archie "dishes" Rhody. I offered him a worm by thrusting it out through the wire within a foot of his nose, but the vigilant Archie reached out through an adjoining opening and grabbed it neatly. Rhody, Archie and Terry (and I) were then in a close group with wire shutting R out. The attitude of the three birds toward each other was casual and R made none of the sounds noted as being reserved for the youngsters.

He picked up a piece of meat, including a yellow-jacket that was on it, permanently crippling the latter, with no evidence that he had seen it at any time. (As several times noted, he is afraid of these creatures).

The foregoing again illustrates the strange aversion of the road-runners to children's voices.

Terry's bill. Terry's bill appears to show still wider separation at the tip.

Birds restless again. Shortly after 12M the road-runners became somewhat restless again. I could barely hear a few children's voices in the distance by listening intently. Doubtless by watching these birds it would be possible to determine, thus indirectly, the school intermissions, etc.

At 4:03 Terry who was trying to help me salvage a mouse which he had allowed to escape, suddenly left and began a ceaseless back and forth--up and down run and flight. Archie was soon infected. I listened--children--the nearest about 200 yards away. I could do nothing with either of the birds. School began this week after a long summer vacation. The overcast sky acts as a sound reflector. The combination occurring at this time probably explains more or less the recent marked increased nervousness of the birds. When the voices are heard, the birds will not eat. It remains to be seen whether they will become accustomed to them.

August 29th.

A little early morning thrasher song, but conventions, if there were any during the day, were held elsewhere.

The young road-runners again reacted to distant children's voices, but it seemed less noticeably. In fact at one time when both of them had settled themselves comfortably on me for what looked like (and was) a long rest, children's voices began to be heard again. The birds merely craned their necks and looked in all directions without leaving their places.

At 3:30 Rhody was noted at the oval lawn. I called to him from this room, but he merely looked at me. However in a few moments he was looking in the window. I invited him in and he promptly accepted. After an initial skid on the tile floor which caused him to hesitate, he walked about inspecting things composedly; here, in the hall-way and down the basement stairs. He tried a few taps at various windows, then came to me for meat, after which he went out of an open window for a long spread-eagle sunning on a balcony.

R, A and T
have moulted the
same tail
feathers.

It was noted that his two middle tail feathers are gone and two new ones are sprouting. Both Archie and Terry have moulted the same two feathers in the last two or three days. (Or rather A has moulted only one as the other is a new one replacing one lost by accident when he was very young. It remains to be seen whether this one will be moulted this season).

Both A and T have been getting new tail coverts for some time and likewise have been picking out loose feathers now and then from their breasts and sides, but not very frequently.

Terry is now reduced to only four principal tail-feathers (rectrices) and one of these was so damaged in the panic of the other day that it will soon be hanging down and have to be cut off.

Archie has 9 rectrices left, all of full length. He brushed the wire of the magpies' cage with his tail and one of those birds promptly seized the tip of a feather. A pulled hard, grunting, so

that feather now has a V-shaped notch at the tip.

rough-neck back
gain.

Perhaps illustrative either of thrasher tolerance at this season (or their present tendency to wander outside their territories) I was surprised, on seeing a strange, ragged thrasher in the moult at the suet feeder, to find that it was Roughneck, still with his crested neck feathers and tamer than any of the other thrashers except B.

Mr. gaping reaction
to human voice.

I have frequently observed, but failed to record, that A and T's gaping when spoken to is frequently followed by vigorous scratching of the throat and sometimes of an ear as well, as if an actual irritation had been caused that was no longer tolerable.

Today when Terry was sitting reposefully on my shoulder, I found that he would also react to a whisper. gaping and scratching. This does not seem to fit in well with the theory of irritation due to vibration, unless we make some additional suppositions, such as, that frequent sensations of irritation accompanying similar experience in the past have produced a sort of "complex", so that (now) the bird responds by reflex action to a similar, but milder, stimulus. (This is not exactly what I mean).

August 30th.

Early morning thrasher song, occasional sub-song during the day.

Increasing (?) tolerance of childrens' voices on the part of A and T.

Rhody very much in evidence and sticking pretty well to the immediate vicinity of the house.

August 31st.

Much early morning thrasher song until about 9 A.M. , thereafter almost continuous sub-song by B until 11, at which time I interrupted him by offering worms .

Rhody hanging about the house and upper garden persistently, looking
 reaction to very sleek, but still moulting.

There is something in red after all. Both A and T objected
 seriously to the presence of Julie, whom they ordinarily trust im-
 plicitly, wearing a red "fez" (Tarboosh). They immediately started
 a mild panic. The only element in the picture that was new to them
 was red. After they had calmed down I found that they became rest-
 less again if they saw ^{the cap} it in my hand.

indifferent. I looked up Rhody to see what he thought about it. He was
 perfectly indifferent.

A and T tolerate A and T were able to overcome their nervousness while child-
 childrens' voices. ren were playing at the 200 yard location, although they stared
 intently in that direction from a corner of the cage and while
 sitting on me.

T has only 2 Terry will very soon have but two whole feathers in his tail,;
 whole tail feath- another damaged in the debacle being broken at the same point as
 ers. the others. (After writing the foregoing sentence I went out and
 cut it off).

Sept. 1st.

full

Much song by B up to about 8:30 A.M., when he switched to
 sub song. When I called him to me later, he burst into full song
 on the ground 10 feet in front of me. I felt highly complimented
 until it developed that he was just starting a singing contest with
 another thrasher that appeared to be several hundred yards to the
 south west. For a time the programme was: Come and get one worm;
 retreat and sing on the ground. over and over.

These doings attracted Rhody from nowhere and he came and got
 what he conceived to be his share, which was all. B retreated
 to a bush 15 feet away and continued his dialogue with the other
 bird indefinitely.

A little earlier Roughneck was working on the upper lawn and

came to the dining room window without invitation and looked in. It looks as if he would be easy to tame again. It is weeks since he has been positively identified here. (One exception?). This is evidently a tolerant period on the part of B.

T's bill.

This does not seem to be getting any worse.

A's bill.

The missing tip seems to inconvenience him little. He still sticks out his tongue occasionally, but the opening seems to be getting smaller.

ervous in
resence of women.

In the afternoon my sister and her daughter visited the cage. As soon as the road-runners saw them coming they became nervous and retreated into the inner cage and ran about, but were not in a panic. However neither would allow me to approach them for a long time, although Archie eventually calmed down and became quite tractable, Terry remaining shy.

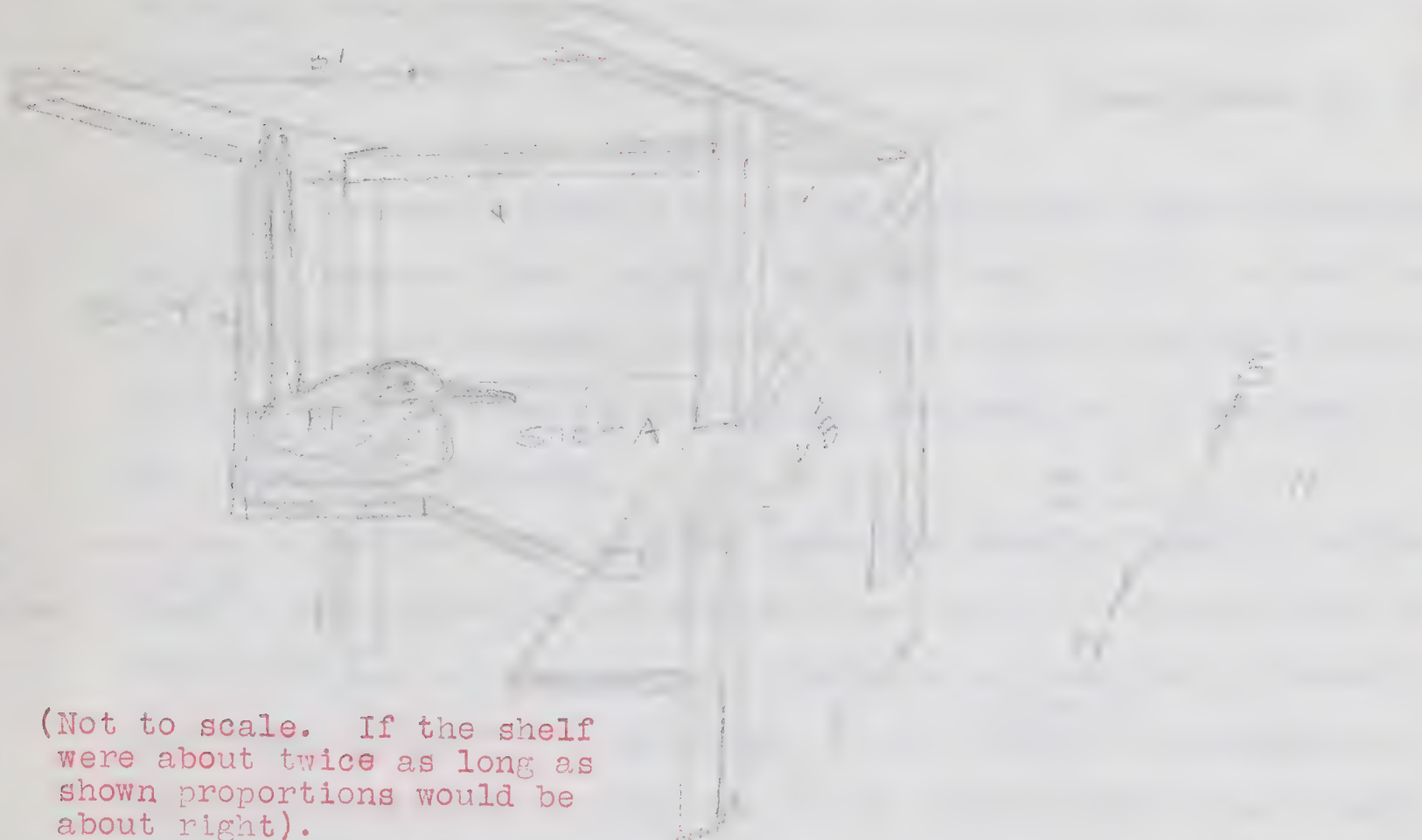
My sister had on a dress checked with red which she covered immediately on noting the birds' fear. This may have something to do with keeping the birds within bounds, although I do not think so.

Before the visitors arrived I was rearranging the birds' sleeping place to give them more room overhead for their tails. (Sounds paradoxical--see sketch on next page showing arrangement). During all the sawing and hammering the road-runners had not been alarmed, in fact were climbing over me and actually trying out the new arrangement while I was still working on it, even repeatedly squatting in each of the corners and flattening their tails against the walls just as they do when settling for the night. (Sketch shows one of them in sleeping posture).

As soon as the visitors left the birds returned to normal at once. Rhody kept out of sight, but the car had not left the driveway before I found he had discovered where I keep the live mice (in the shop yard) and was trying to get at them,

RR's Sleeping Quarters.

Figure 1 - RR's Sleeping Quarters



(Not to scale. If the shelf were about twice as long as shown proportions would be about right).

This rough sketch shows diagrammatically the present stage reached in the evolution of a sleeping place satisfactory to A and T, under the roof in the S.W. corner of cage B (p.1003). They soon began to show preference for this corner, even when there was only a perch there, thus conforming to Rhody's specification which calls for a clear outlook to the west, into an open space, with tail support. (They used the wire mesh as tail support until above arrangement was installed several weeks ago). A flat surface is preferred for support; but in a bush or a tree, a limb or a twig is used. I believe that there is more to this than mere support and that protection

from the rear (and from drafts) also enters.

There is an alternative sleeping place used by Terry frequently, in fact more often than this shelf. It consists of a sort of nest hung from the roof about 2 feet from the shelf. If it were not for Archie's presence I think he would use the shelf more. A good deal depends upon A's attitude toward him at the time of going to bed, probably. However, he is using the shelf more frequently now. The western side of the arrangement is closed in differently from time to time, sometimes all glass, or all wood, or different proportions of the two together. This seems to affect A's decision as to which corner he will take: East or West. If A takes the East, T is almost certain to take the hanging nest, but if A takes the west corner, T is apt to take the east and they will sleep facing each other.

They do not put their heads under their feathers when they sleep.

Sept 2nd.

oughneck and B. These two birds seem to have established some sort of amicable relationship, or possibly a truce, since they are now frequently seen feeding together on the lawn.

Archie and Terry

moult Archie is doing a lot of preening these days and discarding many feathers from his body, neck and head; Terry is much less advanced in that respect, although he has moulted his two middle tail feathers against Archie's one moulted and one lost by accident, but now completely replaced.

juvenile plumage not inferior to adult in iridescence. Hoffman says that the juveniles show no "metallic reflections" in their plumage, but this is absolutely not the case with A and T from the very beginning. Direct comparisons made repeatedly with Rhody himself at close range, in full sun, ^{viewed} and illuminated at the same angle fail to reveal to me any inferiority in the younger birds in feather coloration, metallic or otherwise.

Skin patches back of eyes. The only noticeable difference in coloration is in the skin patches back of the eyes. The colors, particularly the "red", are less brilliant in the young birds. In the young birds this is a "faded apricot" (A's being brighter than T's) in Rhody it is (subject to checking) scarlet. ^{ey}

(In the only two colored illustrations, I have seen to date: Fuertes' in the "Book of Birds" and Mrs. Dickie's work just out, the colors are wrongly placed, as they are also in Hoffmann's description)

Eyes These seem to be now fully adult in color, including the ring around the pupil, which is faintly yellow. as in Rhody.

Bills A's is undoubtedly being replaced at the tip. T's, no change
Sizes Terry still smaller. A looks as if he were actually increasing his margin. A still smaller than Rhody.

Food They are still small eaters. Both are eating smaller quantities

of mice than formerly and larger of meat. This was not originally a move initiated by themselves. T still eats the larger proportion of meat.

ages.

They are now 94 days old, plus or minus a maximum of 2 days.

Sept. 3rd.

The thrasher conventions have not been seen or heard for several days; presumably they are over.

Brownie is now quite sleek and tidy. As yet I have not been able to detect the defect in his left wing flight feathers which had passed through the 2(?) preceding moults without being corrected.

He is not at present singing much undersong and his full song is heard most in the mornings and then invariably.

Archie has reestablished his dominance over Terry, but it partakes more of a givingway by T than of aggressiveness by A. They do not come to blows and either bird is apt to retreat when approached too rapidly by the other, and A occasionally chases T for a few seconds, but does not press the matter. The chasing seems to be in play.

Sept. 4th.

In going to bed in their sleeping quarters this evening A wanted whatever location on the shelf ~~that~~ T occupied. He would dispossess T by rising from his own couch at the other end, advancing upon T, whereupon T would drop down to the ground. A would then occupy T's place for a few moments, and then apparently satisfied by his victory, join T on the ground in peace. This happened several times. What happened next seemed to depend upon which bird went up to the shelf first. Preference of both birds seemed to be for the eastern end. (See sketch p.1042). If A went there first he would stand up on seeing T approaching and threaten him, no matter which end T sought. T would then retreat and stay away for an indefinite period. If T went up while A was down, A would dispossess him whichever place he took and sometimes stand guard at the edge of the shelf to dis-

courage his approach, even. At times he went so far as to occupy the hanging nest (not shown in the sketch) from which he could command all approaches to the shelf and, at the same time, exclude T from that place of retirement as well. (There are perches, not shown but so disposed as to give ready access to the shelf).

This kept up until long after their usual bed-time, and although it seemed good-natured enough and may have been play, I decided to put up a temporary partition at the middle point of shelf A. This I did while A was still occupying the preferred location at the left. His answer to this move was to climb over the partition and occupy the corner at the right hand end; but, tiring of this shallow victory went back to his original place. When Terry then came to the shelf he went direct to the right hand "chamber" without interference from A, and there the affair ended at 6:15 P.M.

Sept. 5th.

ow-jackets. At present the young road-runners are merely killing or crippling the yellow-jackets and not eating them, merely giving one snap as they buzz by and then looking indifferently at the result. Often the carcasses are carried off by other yellow-jackets.

also

Flies Flies are caught in the same way, stalked carefully and often pursued for considerable distances, the pursuit sometimes winding up in a violent collision between the bird and the wire.

The young road-runners have a habit of circling about my feet on the ground with spread and quivering wings, mewings, as previously noted herein. They have become so accustomed to "addressing my feet" in this fashion that, perhaps I should have anticipated an exhibitin of Terry's arising from this practice, at a time when I was sitting on the ground with legs extended out in front. He decided to petition me about something or other (he was not hungry) and confined his plea entirely to my feet, running about them and over my ankles in the process, always facing the feet with mewings and wing quiver-

ings, paying no attention to the rest of me, a curious performance.

Archie was full of the old Nick today in a playful manner, running about at times and rattle-booming sonorously, chasing Terry incidentally without malice, pulling at everything loose: strings, sticks, stones, etc. and breaking off leaves and small twigs, flirting with the magpies.

At bed-time Terry was the first to go and went directly to Archie's favorite couch^{now} at the east end. Archie did not fail to observe this, but, made no attempt to oust him, seeming to be at a loss as to what to do about it and delaying his own retirement for perhaps as much as a half hour. During this period he dusted interminably and mewed about my feet and for five minutes or so sat immovably upon a rock apparently trying to determine upon a course of action. This is quite different from usual bed-time procedure. While on the rock he was as motionless as if his feet were glued there and permitted me to take all kinds of liberties with him without protest or movement. When he finally made up his mind that he wanted Terry's couch, his resolution was severely shaken by an unexpected repulse by Terry-- something new again. After a long period of irresolution he went meekly to the other bed and stayed there. At 11 P.M. I went out and found them both "as they were". This is Terry's first successful resistance to Archie's dictation of choice of bed; and just at the time that A's dictatorial attitude had recovered from temporary eclipse and even reached a peak.

September 6th.

At 5:20 P.M. Terry was again the first to go to rest, again selecting A's favorite spot. A was again perturbed by this change in the trend of affairs, wandering about the cages and mewing about my feet, repeatedly dusting, picking up small stones and trying to "kill" them. He frequently glanced up at the shelf but could not bring himself to attempt to reclaim his old location. He tried

several other places, including Terry's now vacant hanging nest, but did not like any of them. It is significant that he did not venture to oust Terry and, for half an hour, did not even attempt to go to the bed at the other end of the shelf. He was plainly uneasy about it in a pathetic sort of way. At last he hesitatingly went to the west corner bed at the other side of the partition and settled for a few moments, then decide to crawl over the top of the dividing wall, hoping, no doubt that Terry would accommodatigly depart instantly. If such were his expectation, he had a severe disappointment for the moment his head and shoulders appeared on Terry's side, ^{the wild} Terry delivered a stunning attack in deadly earnest, aiming one powerful blow at Archie with his beak, meeting him breast to breast on top of the wall. Archie fled instantly in terror as the blow, which must in some way have been deflected, made the taut wire mesh of the roof resound. T retired to his bed, satisfied, but Archie ran about the cages crying ahk, akh, ookh, okkh and mewing about my feet as if for consolation. This was a severe check to his aspirations and it was fully ten minutes before he again, after much vacillation, attempted to occupy the west corner. Terry then repeated the exact tactics that Archie had used two nights before, suddenly appering, ^a like a jack-in-the box to confront Archie, each time he ventured near either corner, the only difference being that, unlike Archie, he actually aimed blows at his brother. In this manner Archie's morale was badly shattered. He did not at any time, seek to retaliate and fled from Terry at the latter's slightest threat. Once during this episode Terry came down to the ground, giving A a good chance to get the coveted place easily enough, but ^A T was afraid to make the attempt. T had him thoroughly cowed and at such times as A passed him on the ground, aimed pecks at him. In a few minutes T went back to the same place. I stood in front of him to allow Archie a safe passage via my shoulder to the other

bed, but, although he adopted the suggestion, he was too fearful of T to go all the way. At last, however, after many half hearted attempts he succeeded at 6:30 P.M. in lodging himself in the western corner of the shelf. He was still there and everything was peaceful at 8:30 P.M. Terry had kept him out for an hour or more, dominating the situation completely. It is evident that some other arrangement will have to be made in sleeping accommodations. It is, of course possible that, if, as has been stated, road-runners are solitary birds, these birds, as they grow older, may not get along together at all, or with Rhody when liberated.

sleeping in
dormitory tree.

On my return from the 8:30 visit to the road-runners, I turned the flashlight up into B's old night roost in the dormitory tree, and was pleased to find him sleeping in his old roost under the little roof, behind the wind screen. If I could only get Rhody under a roof (and free at the same time) all my special friends ^{sleep} would ~~be~~ dry when winter comes.

Loss of heat from
birds' bodies.

Despite their protective covering of feathers, the loss of heat from the bodies of birds, especially when wet must be large. This loss, during sleep, must have material effect upon their vitality. Doubtless a bird protected from unfavorable weather, but in other respects living a normal life, should have its expectation of life extended.

7/10/44 When one of the young road-runners is sitting on my windward shoulder the warmth from his body is plainly felt on my cheek.

Odor of road-
runners.

Although they are meat-eating birds, A and T have no disagreeable odor whatever. I have repeatedly sniffed at them at close range. All I perceive (and that somewhat uncertainly) is an odor of "warm feathers". Not scorched feathers.

Roughneck.

Roughneck is still here making free with all feeding facilities and using the upper garden much. He had a good meal of seeds

oughneck
its cereals.

and cracked corn and wheat at one of the feeding stations, spending several minutes eating there. This was from choice and not because other food to his liking was not available.

September 7th.

Thrashers singing. Usual early morning song by B. He also resumed sub-song during the day. Other thrashers singing in the distance as late as 6 P.M. At that time B was listening to them and calling: Queelick from a pine tree.

escapes but is caught. Julio informed me that Terry dodged past him and escaped to the outer world yesterday afternoon, going on top of the cage and elsewhere, much interested in things. He was easily caught, but squalled at first.

new sleeping place for RRs. A new sleeping place was made large enough for one bird in the south east corner of cage B. A and T came frequently to inspect, during construction. Terry was especially interested and once got on top of my bare head and insisted on staying there and stamping his feet while I was working. This is a peculiar practice of his which has been noticed fairly often. He gave an especially good exhibition of it on my cousin's head (K.D.) which was witnessed by Dr. Alden Miller and myself. The reason for it is, as yet, obscure. It may be a preliminary to dusting, an ^{actually} act performed by Archie on my head, or a sex manifestation, as it appeared to be in the case just cited, observed by A.M. and me. Terry also insisted on sitting on the hammer when I was about to drive a nail. When the job was finished he inspected it minutely.

Going to bed. About 5:20 Terry was going in and out of the left-hand room of the sleeping quarters, the one that caused the trouble 24 hours before. Archie was wandering about irresolutely but aware of events. Terry quit this and kept away from the place until about 5:40.

learns(?) At about 5:30 Archie made up his mind to go to bed and went directly to the right hand apartment (not the preferred one) and spent

speculation. fully five minutes, motionless, looking into it, as if reflecting upon his humiliating experience of yesterday and aware that it might be unsafe to take the other one, his favorite. Usually he plumps instantly into bed. He then went in and settled himself, arranging his tail properly, but he was watchful and wary. Terry, after rejecting the new place, wandered about restlessly as if also aware that a crisis impended, and at 5:45 suddenly faced the issue by flying directly to the left hand compartment and settling at once into sleeping position. Beyond a mere start on the part of Archie as Terry momentarily came into view, nothing whatever happened and each bird remained quietly on its side of the partition. Soon their lower lids began to creep upward-- the "Sand-man" was coming--and at 6 P.M., when I left, all was peaceful. Are these birds learning from experience?

the better
"student".

Archie, based upon many acts of his, appears to be the more intelligent bird. He learned the secret of the worm-box in one and retains the association thus formed. yet lesson. Terry has had several lessons, but either has not learned to associate it with worms, or else is more indifferent to worms. There is some reason to believe that both reasons apply. Tonight Archie did not at any time appear to consider entering the disputed even when it was vacant. chamber. Terry, on the other hand, never hesitated to enter it, except when Archie (who was invisible to him) was someplace up there. Of course Archie's presence may have had nothing to do with his delayed retirement. There is nothing conclusive about this, of course:

September 8th.

Early song.

Usual early thrasher songs.

Roughneck.

Roughneck still here, apparently perfectly at home.

At bedtime the road-runners seemed hesitant and watchful, but Archie, who was the first to retire permanently, made no move to occupy his preferred place, going directly to the right hand cham-

ber (Room 1). Terry, who had been in and out of the preferred room (Room 2) several times before A went to bed, also finally went directly to his bed, but with one keen glance at the top of the partition as if assuring himself that there was no prospect of an immediate invasion by that route.

September 9th.

No thrasher
changes.

B's song, wandering about the place was first heard before 6.

Roughneck remained on the job.

Lawn digging.

September seems to be the month of greatest activity on the lawn on the part of thrashers. B, it must be admitted, is getting a little careless and is not setting a good example to the others. I suppose that this is the best season for cut-worms. Anyhow they are getting them and the damage is minor.

Road-runner
bed going.

Terry's first symptom of interest in getting his night's rest was first observed at 5 P.M. Until 6 P.M. he was alternately in and out of Room 2, paying no attention to Room 1, although he also tried Room 3 (The hanging nest) and Room 4 (the new one). (The brds enter this one frequently during the day and know all about it, but have not slept in it). At 6 P.M. he went definitely to bed.

Archie went in and out of Room 1 two or three times, paying no attention to 2, whether T was in there or not, finally settling in his bed, remaining watchful for several minutes before relaxing entirely and making proper disposition of his tail. (T's tail, now having only one whole feather in it, and that about ready to break off (or, rather, bend at right angles in the middle in a "green twig" fracture) is no problem at bedtime. When A entered by a route as far from 2 as possible, Terry watched the top of the partition for possible developments for a few moments.

Although there are plenty of comfortable perches in the cage, it is to be noted that both of these birds, as also Rhody when in the cage, prefer to sleep lying down, tails flattened upright against

a wall.

A clear outlook from the sleeping place seems to be more important than physical comfort. This is illustrated in many ways. For example: Rhody sleeping night after night in the pouring rain where the outlook was good in all directions from which an enemy might reasonably be expected to approach, but with a house "behind" him; and in the cage, well backed up, but with head sticking out from behind a wall so that he could command the widest view possible. In the case of Terry before he felt reasonably certain that he ran no risk of being ejected from more ideal locations by Archie, most uncomfortable places would be tried provided they afforded wide outlook and good tail support, such as places fully exposed, against the wire of the cage where there would be only a perch and no chance to lie down. The most ridiculous choice of all--and this made many times during the same weeks of uncertainty--was the upper south east corner of cage C where there was nothing but empty space! From a perch nearer the ground in that corner he would look longingly up into the corner which is surrounded on three sides by wire only and then fly up into it and attempt to cling there. That he wanted to sleep there was made perfectly clear whenever I would hold my hand like a shelf in the corner. He would immediately fly up to it, fluff out his feathers, get his tail properly adjusted against the wire mesh and settle his warm belly upon my hand prepared to spend the night, right there. (For many reasons unnecessary to give here, I did not care to do the obvious thing and build him a proper resting place at that point).

September 10th.

Early morning song from Brownie followed by sub-song for a large part of the forenoon.

12:20 P.M. About noon I could not see or hear B, so looked him up. As I approached the dormitory tree he could be heard singing.

very softly, his slumber song. He was in his night roost singing, at times with closed eyes--very sleepy. As there did not appear to be another thrasher anywhere in the vicinity and he was not at all concerned with affairs outside in the world, presumably the song was an expression of his sense of well being. (I suppose a reflex stimulated by that sense).

1:20 P.M. Brownie continued in his quarters in the dorm, singing slumber song to quarter^{song}, until 1:10, when he departed. In '33 and '34 September singing and roosting daytimes at the same point preceded construction of a nest there eventually_^. (in Sept. or Oct.). What will happen this year has not yet been disclosed.

Unusual Attitude of Young Road-runners

Toward Food.

At 9:30 this morning 16 "pellets" of meat, each about the size of the end joint of an average-sized man's middle finger were put in the cage for the young birds. Not one of these was touched until 1:15 P.M., when Terry ate one. There was no other food in the cage during this period, except as shown later. Occasional yellow-jackets and blue-bottle flies entered and were killed by A and T, but seen to be eaten only once.

About 11 A.M. I placed two live young mice, each about the size of the meat pellets, on the floor of the cage. Both birds repeatedly, although not excited, walked over them, occasionally glancing at them indifferently. Finally Archie, as if annoyed by stumbling over it killed one instantly by pinching its neck and threw it aside. Neither he nor Terry would eat it. A few minutes later A killed the other one, rejecting it also. Both mice were allowed to lie on the ground until noon, when they were removed. About 1:10 I put them in the cage again. They were ignored. Each of the birds was offered one individually, repeatedly. However, when Terry saw me pushing one of them under a rock in the cage, he immediately got

interested (he had just eaten a piece of meat at 1:15) came running up, crouched low to the ground, prodded underneath the rock until he got the mouse, ran off with it and proceeded to "kill it again". This was a process requiring about 5 minutes, (although he could have swallowed it instantly) as he lost interest two or three times and stared off over the surroundings. But he did eat it.

When the other mouse was put under the rock, Archie repeated Terry's performance even to the point selected at which to "kill" it. There, however, he diverged and struck the mouse only once or twice on the ground before gulping it down.

The unusual feature here is really their indifference to food, especially live mice, for so long a period of time, especially as they had had almost no food prior to the observation period, and their prompt acceptance of it when it was presented in a special way. Normally, under similar conditions, the live mice would not have been refused, particularly after they had actually been seized and killed, and some of the meat would have been eaten--certainly some of that offered by hand. The simplest explanation is that they were not hungry enough. On the other hand, both of these birds and big Rhody as well, have often eaten meat that they have seen lying before them for hours and not touched, when I have simply picked it up and offered it to them. Rhody has even eaten meat that he has perhaps stepped on 20 times in 5 or 6 hours when I have merely directed his attention to it.

Their immediate interest in the dead mice when I pushed them under the rock fits in with previous experience with these birds; yet I was unaware that the act would make a dead mouse more attractive than a live one offered in hand. Any object: a stick or ^a stone, a hand, meat, leaf, anything, moved about in a relatively inaccessible position or in partial concealment or as if trying to escape to some refuge, usually arouses their interest at once and they will try

to get at it. If it is found to be edible (often even when not) it is beaten on the ground and "killed". If good to eat it usually is eaten. In the case of these dead mice, relatively unattractive food, they received the semblance of animated creatures disappearing under a rock (known to have harbored similar refugees in the past) thus presenting exciting possibilities which overcame their indifference of minutes before. Completion of the "pattern", I suppose, called for their being killed and eaten.

It is interesting to watch the expanding field of associations growing out of Archie's recognition of the worm box as a container of food. (I do not know the "language"; what I mean is that the number of acts of mine which he appears ^{to think} should lead up to the production of the box for his benefit is growing greater). Thus in the north west corner of cage C is a small bench upon which I often sit and sometimes when there give him worms. If I merely sit there now he is apt to jump up to my knee and wait indefinitely for developments, sometimes examining my clothes. (If there are none he may drop to the ground, mew about my feet, pick up a small stone and hammer it on my shoes, or run his head, neck and shoulders up a trouser leg and snap the elastic of my garters). A movement of a hand to the small pocket of the coat where the box is kept often causes him to jump up again. This pocket is inside of a larger one ^{once} and today when I was sitting on the same bench, not thinking of offering him worms, I reached into the larger pocket and produced a package of cigarettes. (K.D. saw this). Archie was up instantly and drew out a cigarette neatly. He must have started when he saw the movement of the hand into the pocket.

Again the box can be made to give out a snapping sound (somewhat in the manner of those "frogs" which lecturers use to signal the operator of a projector). I have not yet deliberately tried to attract him by making this sound, but once or twice have made it

accidentally and he has shown some response. I shall experiment with this. (This box is peculiarly "noisy" and has a certain fundamental note which is brought forth by the slightest manipulation of it, in addition to the "frog" effect. It is not loud, but it is distinctive--a resonance phenomenon--not caused by buckling of the metal. A. shows signs of noticing it when I handle it). He has now so many things which he associates with the meal-worms, that, in trying new ones, the old ones will have to be masked in some way.

Both birds were shy in the afternoon in the presence of Mr. and Mrs. Frank Leach. although neither wore any conspicuous colors. T. would not come out of cage B at all into cage C, near which the visitors sat. A came out only once.

At bed-time each took the place which, at present, is his usual one. Their behavior was somewhat confused on account of fear inspired on two occasions during this period. +

One: The voices of children at play 220 to 250 yards to the south.

Two: The passage of two open busses loaded with people; loud tooting of horns.

September 11th.

Brownie sang full song frequently from before sunrise until noon. In the afternoon he changed to under-song in which the hen's cut, cut, ka-da-cut was often heard. By standing near him it became evident that his full song, at that time, which was of a peculiar staccato type, was stimulated by similar efforts of a thrasher 3 or 400 yards off to the south west. B's individual burst of song varied in length from about 5 seconds to over a minute. A fair average length was perhaps 10 to 15 seconds.

No thrasher conventions have been noticed for some weeks.

No carrying of twigs and investigation of nesting sites.

+ (Archie was still out of bed at 6:15 P.M., when I left, but was in Room 1 when I went out after dark).

Neither road-runner had any mice today--for the first time in weeks. Neither showed anything but the most casual interest in two rather large white mice liberated in the cage. When one of the mice was put under the rock, Archie made a few half-hearted prods at it and went off about other affairs.

The opportunistic Rhody came about this time, so I offered one of these mice to him. He took it, ran off and killed it, started to swallow it, stopped, "tasted", stared at it for a few moments, then (Later, 10:20 A.M., 12th. It trotted away, abandoning it for good. (is still in the same place).

About 3 P.M. both young road-runners became nervous as I approached the cage, then began to run about, to my surprise. I was carrying a writing tablet in my hand, thinking nothing of it, until, looking down at it, I noticed it had a red cover with large black letters. All fear vanished when I put it behind my back, only to reappear whenever it was brought to view again. Turning over the tablet, showing only the white back--the birds seeing the turning operation, allayed their fears, although they eyed it suspiciously a few moments as if to satisfy themselves that the red monster had permanently reformed. Several repetitions of the turning movement caused alternations of nervousness and calm, Terry, as usual being the more nervous. The tablet was only $8\frac{1}{2}$ inches by $5\frac{1}{2}$. They had never seen it before, as it had only just come into my possession.

When the red cover was removed (some distance from them) and the now entirely white tablet was presented to their gaze close to the wire, Terry came at once and, without hesitation, reached through the mesh and took a corner in his bill and pulled it. Evidently there is something in red, after all. Here was a test, initiated unconsciously by me, and therefore without my being biased by previous experience, at least until the birds had shown their first reaction.

Bed-time.

The Rrs went to their, now usual beds, requiring about a half hour to become settled permanently, beginning a little before 5,

with full sunlight on their beds for the first time. (Owing to the southward movement of the sun's having brought it, ^{now} at this time of day, into position where it shines through a gap between the house and a group of pines to the west).

When the birds seemed fully composed for the night's rest, facing each other a couple of feet apart (but separated by the partition) I approached with their "night-caps" of meat pellets. They simultaneously lowered their heads to the shelf, opened their bills wide and "maa-a-a"ed softly, just as Rhody does.

There was a difference in pitch between the two sounds, the interval (which was not constant) being such as to produce a slight dissonance of irregular frequency. (To be verified).

The mirror is still placed so that Rhody has ready access to it, in fact can not avoid seeing it very well whenever he comes to the cage. He is indifferent to it, though occasionally looking at his reflection in it casually. This attitude is practically that of the young birds when it was inside the cage. It suggests that his earlier enthusiasm was that of a bird in the presence of a mysterious stranger of its own kind that mocked his movements. Now the two young birds are quite obviously there to be seen in the flesh and present no mystery, behaving normally. Being no mathematician, Rhody perhaps is not excited when he sees three road-runners in front of him, any more than he is by ^{one} two. Anyhow, the numbers are constantly shifting before his gaze and one more or less does not register with him.

September 12th.

Young RRs and
caterpillar.

About 9:15 A.M. both A and T became interested in a large black and brown caterpillar moving rapidly toward the cage.

I put it through the wire. A got it first and instead of bolting it at once held it gently in his bill, shaking it slightly. (Here was ^a chance to see what this ground-cuckoo would do as compared

Second Road-runner
400 foot reel.

1.	Rhody in nest.....	June 9th., age of young: 9 days, ± 2.
2	Rhody, A and T in nest	" 10th. " " 10 days, "
3	Terry and Archie in Dr. Reynolds' hand, on ground and Rhody watching.	June 12 age of young 12 " "
4	Archie at tool house window.	" 15 16
5	Archie on ground, " dusting, A and T on ground, Quail watching them . . .	" 17 17
6	Archie and Terry and alligator lizard. A "sunfitting".	" 19..... 19
7	A and T in small cage	" 22..... 22
8	" " " on bench	" 23..... 23
9	" " " " " (kodachrome)	23 23
10	A and T in large cage, watching Rhody outside, and R outside getting meat.	Aug. 5..... 67 days
11	A and T on my head and shoulders	Aug. 5 67
12	Cuckoo markings on tails and watxhing something	" 5 67
13	A and T watching Rhody	" 17..... 89
14	" " " (kodachrome)	" 19..... 91
15	Ditto and Rhody, k-chrome"	20..... 92
16	R comes for meat and mouse"	20
17	R catches worms--misc. closeups.	" 20
18	R takes mouse from hand.	" 20
19	Archie spread-eagles on rock (kodachrome)	Sept. 14..... 117 days, ±

with his cousins who are reputed to swallow caterpillars, "fur" and all, lining their gizzards eventually with a coating of the hairs which embed themselves in the inner coating). I expected him to bolt it, but instead, still holding it carefully, (so as not to break its skin (?)) he rubbed it carefully on the board floor of the platform. For a reason not apparent at the time, this did not prove satisfactory. (There was absolutely no "killing" action). He took it to the hard, but sand covered, ground and rubbed off, much to my astonishment, every vestige of the long hairy covering, without breaking the skin, until the caterpillar was a smooth, grey, hairless worm, looking like the fat cut-worms that Brownie extracts from the lawn. (The ground furnished the sand-paper). These caterpillars have very tender skins, yet the skin was unbroken until, manifestly satisfied that the creature was now properly prepared for consumption, Archie gave it a few whacks on the ground, according to best road-runner tradition, then gobbled it.

This particular kind of caterpillar (larva of the Monarch (?) butterfly(?)) is very uncommon here at this place. I doubt very much if Archie had ever seen one before, yet he knew exactly how to handle it in every detail.

At bedtime there was no conflict and the selection of beds was unchanged, Archie waiting a long time after T had retired before following suit.

Thrasher situation remained unchanged.

September 13th to 15th., incl.

Up to 1;30 P.M. on the 15th. (the time at which this memorandum is being written), there has been little change.

Roadrunners

Bedtime behavior unchanged, A holding back before settling permanently long after T seems well settled for the night. There is some mutual suspicion.

at

Moult.

Archie's crest is now thinner and the back of his neck the skin may now be seen through the feathers.

Beginning yesterday, Terry began to shed feathers more rapidly than Archie, sometimes, when preening, 3 or 4 feathers floating off at once.

Neither bird has moulted any more rectrices than the two middle ones on top, but are still occasionally losing a tail covert feather. The moult seems to have begun there.

At the present time feathers are being lost from the head, neck, breasts, sides, flanks, backs and rumps, i.e.: from practically the whole body, in addition. (Also wing coverts).

No flight feathers seem to be missing from the wings, unless one that I found several weeks ago came from one of these birds.

As exemplified by these birds: Birds do pull out feathers with their bills while moulting. (Ref., Rhody pulling out tail feather last year). (Also thrashers).

Food (Fruit).

I have repeatedly tried both of these birds with fruits of all available kinds and they have been indifferent to all of them. Yesterday, however, I found that they really appeared to like the fruit of that firethorn sold here under the name of *Pyracantha crenulata*, even running to me to take it. Oddly enough there is one of them blazing in their cage and they make no effort to get the fruit themselves--another illustration of the willingness of birds to try anything offered them although it may have been consistently passed over by them before having had their attention directed to it.

Red fruit not feared.

It is also worth noting that, although this bush is brilliantly red with fruit, they show no fear of it. Perhaps because the bush is a familiar, not-moving object and the change to red has been gradual.

Food (Mice)

Archie remains fonder of mice than T, yet both are becoming more dependent upon the supply of butcher's meat and not infrequently reject mice, even the small live ones.

Feeding time.

Food is most actively sought and eaten in the afternoon, principally just before bedtime, though they are chasing flies, etc. a good part of the time.

Reaction to voices.

They are becoming less disturbed by childrens' voices in the distance and while they still listen to them keenly and are made restless, they are not now panic-stricken.

Now tamer.

Archie is now the one that seems to like human company most, and is, at the same time, less restless.

Thrashers**Song**

Early morning song continues with occasional full song as well as sub-song at irregular intervals throughout the day. When B is heard in full song it usually means that he is exchanging it with one or more distant thrashers, at the present time.

"Conventions"

None observed during this period.

Moult.

All seen are in the moult, but Brownie seems to be ~~about~~ finished. He is unbelievably sleek in contrast with his late state.

B's wing.

I am unable to detect the presence of defective feathers in his left wing any longer. After several moults this trouble seems to have been overcome.

Nesting (?)

No twig-carrying has been observed since the last nest, and there are no obvious signs of any intention to build again this year, unless his calling Nova (?) to the dormitory tree this morning may be construed as diagnostic.

September 16th.

September 16th.

Thrashers

At 7:30 A.M. Brownie evidently decided that he had done enough singing for the forenoon, so came to me for worms. While sitting on my knee waiting patiently for each worm to be handed him, he "talked" softly, as I supposed, to me. It developed, however, that he was really keeping in touch with another thrasher nearby, for one soon came out of the bushes surrounding the oval lawn, showing little concern at my presence. I could not identify it. They soon got together and went off amicably exchanging low comments.

Roadrunners.

"Panting"

Temperature
conditions.

At about 9:30 A.M. Rhody had eaten his day's supply of meat outside the cage and sat panting in the shade on top of the cage. (Temp. in shade 72). The young birds were also panting. In doing this their tongues are seen to lie snugly in the lower mandible, reaching only about half way out to the tip of the bill and sliding back and forth smoothly in synchronism with the rapid, rhythmical swelling and contraction of the throat near the base of the bill. It looks as if this were a throat action entirely and the lungs not participating, so that the cooling action is dependent upon evaporation from the tongue (as in the dog(?)) and, or from other internal surfaces other than the lungs.

It will be noted how this observation again checks with previous ones bearing upon the moderate temperatures at which these birds -- under local climatic conditions -- call upon reserve cooling apparatus.

Eyelashes.

Eyelashes are not set in the rim of the lid as in human beings but some distance back of it, tangential to the surface of the lid. This setting, by providing additional support to the lashes at points part way out on the shafts enables the lashes to offer greater resistance to the passage of objects from above than would otherwise be the case, and, at the same time directs them downward. They are not curved downward, but backward. (Description incomplete).

Skin patches.

The skin patches back of the eyes have a crepe-like texture. The play of muscles may be seen beneath the surface. In repose only a relatively small portion of the area is visible, and that predominately white--an acute isosceles triangle, base at the eye. This form is not that of the patch itself but of the ~~expanding~~ frame formed by the surrounding feathers. These feathers are shifted when the bird displays the patch, which then takes the form of the diagram below. The colors are placed as there shown, and in the adult bird (Rhody) are (subject to more exact designation when compared with standard chart of color) as indicated. This diagram may have to be altered somewhat later as the extent of the blue along the lower margin is not easy to determine in the living bird.

*(This is not supposed to
look much like a
roadrunner!)*

It has not been possible as yet to determine how far the color extends beneath the feathers. However, the back of Archie's neck now has so few feathers that it is easily seen that the red of the two patches comes within about three eighths of an inch of meeting there (9 to 10 mm.)

The slate color extends out under the feathers. Both lids are of that color, with the exception of white "bead" that borders them.

The blue merges gradually into the slate as well as into the white.

The red is rather sharply defined.

There is a clear white as well as a bluish white.

Hoffmann's description. Hoffmann's description is defective: "naked patch of bluish gray back of eye, bordered above with white and ending in a red spot; of skin patch sometimes concealed if the head feathers are not erected", if applied to "my" birds. "Bluish gray" may be passed over without argument, (although it does not describe what I think I see) because of unavoidable personal equation in naming colors; but the white border is simply not there and the patch is never entirely concealed. Further, the area shown is independent of crest's being erected.

Fuertes' color portrait. (See The Book of Birds, by Natl. Geog. Soc., p.45). This omits white entirely, replaces the slaty blue (or bluish slate) and has too large an area of red (or orange) beginning too far forward. (Skin patch) Furthermore, the patch does not make a marked angle with the upper mandible and the red occupies almost entirely the downwardly curved rear end. It should be broad there and not pointed, though part of the pointed appearance in the picture may be ascribed to foreshortening due to a portion of the patch's being on the back of the neck. Incidentally the size and placing of the eye constitute a gross libel on the bird.

Mrs. Wheelock's description of skin patch. Mrs. Wheelock's description places the naked skin patch in front of the eye! The white is omitted entirely and the only colors are blue and orange.

(Incidentally the rest of the description of the bird, which I am not dealing with at present, is correct in very few particulars! One instance, however: There are 6 not 4 white "thumb marks" on the tail feathers). *Really 10, but 6 make conspicuous pattern. & some of the others wear off. See 31*

Western Bird Guide. Colored illustration and description omit the skin patch entirely (Incidentally the bird would be unrecognisable from either

Dawson on skin patch. (This and the foregoing are the only descriptions I have seen, as I have not looked up the literature extensively).

On the whole, the most accurate description of the bird's plumage. Surprisingly good. As to skin patch: "A bare space around and behind eye (nearly meeting fellow on crown) blue, bluish white, changing posteriorly to livid orange." Crown is a distinct slip, as the place of near approach is at the nape of the neck (and possibly also partly at the occiput--to be looked up)*. He overlooks the slate which almost encircles the eye and also the fact that the blue-white does give place to a clear white almost directly back of the eye. The "livid" in livid orange is decidedly not present in my birds, if by livid he means a leaden hue. Orange may be correct, but it does not strike me as being red enough for Rhody, though too red for the youngsters.

*mostly occupied

Mrs. Dickey's colored I have not read the description and have had only one photograph. **hasty glance at the print, but the latter was enough to show wrong (skin patch) color and location of color. Not having it before me I can not go into detail.**
(It will be noted that these criticisms are made only of works for popular consumption).

Moult. A rough count made today indicates that the young road-runners moulted probably as many as a hundred feathers today and yesterday. Moulting of the body feathers seems to be at its height.

"Approach Reaction". Archie has a peculiar trick when on the ground and approached by me of squatting close to the ground, shaking his head rapidly sidewise and saying wakh, ookh, etc. when it seems that I am about to step on him. Sometimes he gets out of the way and sometimes lets me step over him.

"Corner Reaction". Neither bird, when in a corner of the cage, likes to be approached too rapidly, either by me or by its fellow. This applies also to an unexpected approach, slow or otherwise.

An odd dusting behavior. Archie (Terry to a less extent) has some sort of associations or chain of reflexes that causes him, fairly often, to pick up a stone and then dust while holding it in his bill. This may be varied by his laying his head on my foot and then dusting, both with and without the stone (or sometimes the most handy object). When I sit in a certain place in the cage it seems to stimulate in him the desire to dust at my feet, although the particular spot is not the only good dusting place.

Jealousy(?) Terry was A great many times Archie has driven Terry away while dusting at my feet, and then done the same thing himself, although he does not usually object to Terry's dusting at the same spot when I am not there. Perhaps seeing Terry dusting has merely stimulated him to do the same thing and no jealousy is involved.

Reaction to voices. Entry of yesterday under this caption is somewhat negatived by an incident which occurred later yesterday, at bedtime. A was in bed at about 5 when, about 150 yards away, yelling youngsters started a roller-coaster down the sidewalk. Archie bolted from his bed like a shot and there was soon a panic which lasted 15 minutes (or until the children could no longer be heard).

Bedtime. Tonight is a warm night, (76 at 7 P.M., 74 at 8, 71 at 10:30). Archie, the first to bed took Room 1--now his usual one. Terry, perhaps on account of the warmth, took the hanging nest (Room 3) which is less sheltered; the first time for many days.

Brownie B slept in the dorm, although he certainly needs no shelter of any kind tonight and I rather expected him to take the acacia.

Thrasher reactions. Shooting a rabbit today at the oval lawn produced typical thrasher response, viz: B, who was singing about 25 feet from the rabbit (hen, russet-backed thrush and tree-toad mimicry) stopped for a few moments and then resumed his song. Roughneck (identification uncertain) came from the other direction and inspected the dead animal curiously.

Relaxation of territorial vigilance(?) While B was singing there were two other thrashers sitting quietly in the same clump of shrubbery (Perhaps Nova and Roughneck). Anyway there was no effort made to drive them away. If both were females, perhaps they would not have been in any case, but if males, territorial claims have been relaxed.

September 17th.

8:30 A.M. (Temperature 73). This looks like the beginning of a pretty warm day. (B is sounding his remarkably human "whistle-kiss" call). (If it were not that he is also singing full song, it would be completely deceptive. Even so, it sounds as if some person, listening to his song, were trying to call him). As judged by vocal response, it has successfully summoned Nova.

(Above is parenthetical to what I came in to write when "interrupted" by B).

Roadrunner
moult.

The youngsters have already sought the shade. Terry is preening actively, and in 3 minutes, removed more than a dozen feathers at "reading distance" from my face. He does pull some of them out. Amongst them were two scapulars 4 or more inches long. At the present rate of removal, yesterday's estimate of 100 in two days was far below the truth. Road-runner feathers are now "everywhere".

Panting again.

RRs.

The panting of the road-runner is accompanied by slight synchronous movement of the lower mandible. About 2 inches of the throat participate in the bellows action. I can hear nothing of movement of air at about 6 inches distance. In time with the panting there is pulsation of the "red" skin patch. More precisely there seems to be movement under the skin--in a direction parallel to the bill--of a vertical (more or less), thin, almost thread-like process, which oscillates in a direction at right angles to its length.

Magpies.

The magpies, however, merely hold their bills wide open without perceptible movement of any kind.

Effect of loss of
tail feathers on T.

The breaking off of Terry's tail feathers affected his movements noticeably even when but a few of them were gone. It is noticed in his maintenance of balance and heavier landing after flight. Thus it acts through its loss as a "balancing pole" and as sustaining surface. It interferes with his preening on a perch without danger of falling off. When thus preening he appreciates the additional support of a finger placed along side of the perch to give a wider base. He can then scratch, stretch, preen in safety. Thrashers and road-runners, except when dynamically unbalanced, do not grip their perches hard, depending upon their balancing powers. They merely stand on them.

Rhody

and caterpillar.

About 3:30 P.M. a caterpillar of the same species as that given Archie the other day, was found and offered to Rhody, who, as often is the case, happened to be present at the psychological moment. He handled it in the same way as Archie, though less careful to remove all of the hair. Evidently, therefore, this treatment of caterpillars is a part of road-runner tradition.

Trailing Rhody.

Quail
come to see
him.

At 4:08 Rhody began working off to the west. He followed the route usual with him before his "marriage" when he slept in the Scamell's oak regularly (for 7 months(?)). When he got out the side gate at the top of the bank he dusted--true to precedent, in precisely the same spot as formerly. While still there, a covey of nearly full-grown quail, with an adult pair, deliberately came to inspect him, which they did for about 10 minutes, the nearest eyeing him curiously from about 4 feet distance. They showed no fear and was indifferent to them. The parents ~~also~~ were indifferent to his presence.

Picked up things

Autumn Colors
(Sept. 17, 1935)

It is popularly thought that California has "no autumn colors" because "it doesn't get cold enough", and that such colors are, where found, a result of frost.

It is true that, in the more thickly settled portions which are naturally those regions of moderate elevation, there is not the vivid autumnal coloration seen in colder climates and at higher elevations, even in California.

The principal reasons for this absence appear to be two in number:

First: The scarcity of deciduous trees of the kind which, elsewhere, are common and take on brilliant color before the leaves fall.

Second: Deficiency of soil moisture during the late summer months which checks growth of leaves and causes them dry up without undergoing the chemical changes incident to the production of color.

Where deciduous trees, such as maples, for example, have been planted or are indigenous, along streams or where they get ample supplies of moisture, autumn coloration is not inferior to that found elsewhere. Frost has nothing to do with it.

Thus at this place, the Boston ivy (*Ampelopsis Veitchii*) is now brilliant on walls where the plant has had sufficient moisture, but not too much, and not too much sun, and fully green on walls where the plant has had enough water to keep it in active growth. Frost has never been known here in September.

Where there is too much sun and too little water, the leaves dry up and fall without turning.

Where there is a slight deficiency in moisture and not too much sun, the leaves color earlier, but brilliantly.

Where there is an abundance of moisture and not too much sun the leaves are green still.

A plant on the north wall may be brilliantly colored, but all leaves of that same plant where the branches have gone around a corner and are on an east wall may be green. Where these branches continue onward and again spread out on a north wall (the same plant) there may be an abrupt change from green to autumn colors abruptly at the corner. An actual case here. There is another plant here, with slightly deficient water supply that is fully colored on the north wall, just beginning to turn on the east wall and nearly fully colored on a partially shaded south wall. (On south walls it hunts for shade). Another one growing at the base of a south wall has green leaves on the east wall (partially shaded), also under the south eaves, but where exposed to the full sun on the south wall (which it is trying to avoid), the leaves, while still green, are beginning to show signs of passing directly to the dry stage.

Another growing at the base of a north wall with plentiful water supply, is wholly green on north and east walls (the only walls upon which it spreads).

A Japanese maple here in partial shade was experimented on. It is at present entirely green. Formerly its leaves turned brown and fell without coloring. I found that, if given sufficient moisture, it will color splendidly.

R preens without losing feath- (some of the quail remaining to watch). During this time no
 rs. feathers whatever were removed (Moult finished(?)). Next he
 considered crossing the street to the Scamell's, but doubled back
 several times on account of passing cars, before crossing leisurely
 to inspect a car standing in front of the house. While there,
 another car drove up and Mrs. Scamell got out of it, Rhody moving
 over to her front porch while we discussed his probably roosting
 place, suspecting it to be in the lot west of my place. R sat on
 the railing for 5 or 10 minutes facing his old roost in the oak 15
 feet away. Thus far he had followed exactly his old route to that
 roost, except as disturbed by cars. He next came back toward us,
 recrossed the street (in the reverse direction) and made for the
 suspected lot. I then followed him when he entered the thick
 undergrowth. He was very deliberate and not alarmed. He climbed
 into an open, scrubby tree and sat quietly there for several minutes,
 while a linnet called anxiously over his head. He then worked upward
 and northward in the tree with extreme deliberation until he reached
 the end of a limb about three feet away from a densely foliated
 branch on the next tree to the north. He jumped across this space
 and immediately settled to rest. This tree is on the edge of a
 bank about 15 feet high and overlooks everything to the north, west
 and south. There is a thicket to the east up to my western line.
 In every particular this roost fulfils Rhody's specification for
 an arboreal night roost insofar as it is known to me and as it has
 been set forth herein, viz: An extended outlook to the west with
 open space in the immediate foreground for an emergency landing
 field, unobstructed rays of the setting sun, suitable tail rest,
 a measure of protection from the rear (he always faces west), a
 relatively open situation but, at the same time concealment for
 himself and plenty of space in which to observe approaching ene-
 mies from most probable directions of approach; also no great
 distance from this house, i.e. from known sources of food and water.
 This place looks as if it might be his present night roost (and,
 for that matter, his past one for a couple of months). He arrived in
 it a 4:58 P.m. (On my return here the youngsters were still up).
 (The linnet followed him immediately to the same tree).

September 18th.

Road-runners

At 7:45 A.M. Rhody was not in his night roost, but shortly
 after was here partaking of various offerings and waiting patiently
 for each to be forthcoming.

AR digging.

Road-runners are not great diggers, but occasionally sweep
 loose soil, leaves, etc. away with their bills when there is pros-
 pect of food beneath. R did this to see if I had dropped any worms.

Use of feet.

Only twice have I seen a road-runner intentionally move any-
 thing with its feet. Once Rhody, with sidewise sweeps, made a smooth
 place in which to lie, and once, Archie did the same in a corner of
 the cage with the same object in view.

live

What does this
 mean?

Archie, who had just had a mouse, which he had repeatedly
 picked up and lost interest in, not being very hungry, came and
 ma-ed about my feet in characteristic fashion. He certainly was
 not hungry. He got up on my shoe, facing the toe, with his tail
 up against and parallel to my leg and began stamping with his feet
 alternately, wings partly spread, and pecking at the toe of my shoe.
 The results, perhaps proving disappointing, he went off and came
 back with a short, thick twig which he laid at my feet, still ma-
 ing. (a as in hat).

Next he brought a short, thick, heavy piece of bark and went off to "think things over", returning occasionally to take a turn about my feet with some one of his various vocal comments on things in general. (9:30 A.M.).

"rugging" habit. The single, horizontal, forward flirt of the wings has been recorded before. A common gesture made while looking at some object that has just attracted their attention, often followed by a "pooh" as the bird turns away. The air of the whole thing is that of one dismissing the matter with a shrug and an exclamation of contempt, as being of no consequence. Sometimes this is done apparently apropos of nothing objective, as if evoked by some inner thought!

A new phase of the "shrug" (rugh). 11:45 A.M. (About an hour after writing the preceding paragraph). As I stood in cage B near the wire which separates it from C and the pyracantha bush in C, Terry approached on the ground, looked up at my upper story which was clad in a shirt of "airplane" cloth (a material on which the road-runners cannot cling because their claws can not penetrate the close weave) and repeated the gesture just described several times in succession. My first thought was that this action was not in harmony with the implications of the paragraph just written, but second thought suggested that Terry really wanted to get at the pyracantha berries which projected through the wire, considered me as a ladder, but, as indicated by the gesture, for some "reason" was about to abandon the enterprise. (It should be noted here that he had never shown any interest in this bush). The "reason" may have been based on previous experience with this shirt as a ladder. Anyway, with this thought in mind, I held out an arm within his reach of the berries and he immediately flew up to it and began sampling the berries.

**Anthropopa-
thetic inter-
pretation.**

**More
Atpti-ism.**

In this instance, the gesture, which was not accompanied by the crouching motion that indicates contemplated flight, actually appears to have^{been} associated with a sense of frustration.

RA bills

Archie's bill is making good progress toward recovery. The upper mandible is still a trifle shorter than the lower, but is curving down neatly. He does not appear to be under any handicap.

Terry's bill-tip did not break off after all and seems to be normal. I suspect that it has received a little reenforcement--it looks so.

Rhody's bill has just (3 P.M.) been under observation where he sat dozing on a low branch after eating some meat and a large, live white mouse. The tip is strongly decurved and much more hawk-like than either of the youngsters'. The hook extends well below the lower mandible and is both sharp and strong.

**Archie and
worm box.**

Archie is now so sure that, when I sit down, any place, and put a hand in any pocket, the worm box will be forthcoming, it is difficult to differentiate amongst the various associations to which he responds. He does react to the "frog" sound of the box but it has not been possible to disassociate that sound from one of his other associations with worms, viz.: myself.

Due to the fact that the worms within the box are concealed in bran, and he is sometimes allowed to dig them out himself, he now associates bran with worms, as exemplified by an incident about a half hour ago, when he had exhausted the worm supply by direct action at the box. I put bran containing no worms in the palm of my hand and invited A up. He immediately began scattering the bran and whenever and wherever my palm was exposed, pinched and pulled it energetically, although normally he will not do that. (That is one reason why I know that his bill defect does not now hinder him greatly). When the remaining bran was dropped to the ground he

dropped down from my knee and searched it thoroughly for the worms which were not there.

**B's versatility
in song.**

Brownie came to me for worms by the lemon tree at the oval lawn, then retired to the ground about 8 or 10 feet away and sang quarter song continuously for about an hour, stopping only when pigeons approaching on the ground, caused him to move elsewhere. During this hour (estimated) there were no pauses in the song for more than 4 seconds (by the "one hippopotamus" method) barring one of about 10. Even pauses of 4 seconds duration were rare. With the exception of a few phrases that I have recorded and three or four different kinds of imitations, it was all made up of "words", and indescribable sounds, constantly changed and apparently drawn from an inexhaustible vocabulary and repertoire. Granted that one is unable to grasp and later recognise, when again heard, syllables and sounds from a rapidly uttered and complicated performance like this, still it is my belief that Brownie has, in "music and words" actually thousands of phrases. (In "words" alone, or rather complete phrases of syllables--not counting individual syllables--I wrote down long ago somewhere in the neighborhood of a hundred different examples, and I am satisfied that the number thus recorded is but a fraction of those actually heard but impossible to put in written form).

**Rhody's night
roost.**

At 6:45, I went to the tree into which Rhody retired last evening. He was there, in the same spot. Evidently this is it.

September 19th.

Thrasher song.

Thrasher song was heard at 5:30 A.M. and was fairly continuous until about 9; Brownie was assisted by several other thrashers off to the north, west and south.

Road-runner eyelashes

**Lashes on lower
lids also.**

By scrutinizing A and T at "reading distance" (9:30 A.M.) it was seen that, as suspected, they have lashes on the lower lids as well. These are very fine and short and, from present observation seem to begin at the forward corner of the eye and end about half-way back. (A magnifier might show greater extension).

**Lashes are
moulted.**

It was noted that Archie has lost several of his upper lashes on both eyes; the follicles from which they grew can be plainly seen without optical aid. Presumably eyelashes participate in the general moult and at the same time. T, as usual, is behind A.

**Particolored
lashes.**

On both A and T the three or four lashes on the upper lid located near the anterior corner of the eye are not entirely black. They are "white" from the base for perhaps half of their length and then black. (I wonder what function this serves).

Rr"mouths "

Rhody

As far as can be seen Rhody is all "black" (probably a deep purple) inside his mouth--tongue and all--as far back as the gape, (?) and perhaps further.

Archie

Archie, who can be observed to better advantage, is the same, except as to a line (median line)* on the inside of the upper mandible beginning at the tip and broadening as it extends to the rear, which is colored more or less like the lightest portions of his bill, and which seems to like it in texture. (As recorded, both youngsters were originally pink, and the change of color, when first seen in

+ a sutured?)

both birds began with the tips of the tongues.

Terry

As in other respects, Terry is again less advanced in this change than A. There is still a lot of pink left in his mouth. Along the margins where change is taking place there is a gradual shading of the pink, through purple to "black".

Caution.

(These observations, of course, depend upon having the goodwill of the bird, and are naturally less reliable than if they were made under controlled laboratory conditions).

September 20 to 24th., incl.

During this period observations were continued as usual--there was little change.

Thrashers

Song as usual.

There was the usual early morning song, both here and at a distance. Neighbors are commenting upon the prevalence of thrasher song in this section of Piedmont, and are delighted. I am told that they are giving me credit for "bringing the thrashers here."

B responsible for much song.

Brownie, I think, is principally responsible, and to him the credit should be given, as his children probably have established themselves not far away. Certainly the frequency of thrasher song is much greater than in past years.

Roughneck.

Roughneck was not seen with certainty during this period.

Nova.

Nova was not seen at all (and identified), but was occasionally heard.

No nesting.

No nesting activities were noted.

B's songs.

Brownie, besides singing full song in the mornings, with an occasional outburst during the afternoons, was sub-singing for long periods of time, mostly near the oval lawn.

"The" fly on the job again.

This afternoon (24th.) he was seen to jump suddenly into the air a foot or so each time, scratch and look worried, plainly expecting further attacks from some tormentor. I called him to me and while he was sitting on my knee "the" fly crawled out of his back feathers and crawled about. B does not seem to be able to get rid of these pests.

Road-runners

Progress in changing food habits.

Both A and T frequently refused live mice, at times even stepping upon them indifferently. Once, even, Archie reached over one, that he "knew all about", in order to get a piece of meat, which is a great condescension for him. Usually when he catches one, it squeals, but today, he caught the same one several times (perhaps a dozen) without hurting it at all, finally letting it go. After that he ate some meat.

Moult.

Still no tail feathers have been moulted except the two middle, upper ones on both birds, and no flight feathers. Terry's new ones seem to be growing out at the rate of about a quarter of an inch per day. (I.e.: these two tail feathers).

The "soft" feathers are being rapidly replaced.

Terry is beginning to follow A in moulting his eye-lashes.

A's domineering. Archie's domineering attitude toward Terry seems to be increasing somewhat in insolence, but it is noticeable that he still keeps away from Terry and his bed at bed-time.

+ See later, p 107.

Negative reaction to skunk odor, by A, T and R. A spotted skunk ("Civet cat") was caught in the box trap within a foot of the poultry wire mesh of the cage. When shot with a 22 calibre rifle, a thin white mist arose from the trap carrying the characteristic, powerful odor. The two young road-runners gave not the slightest heed to it, although the odor in the cage was almost overpowering.

Later, after the trap was washed out with a hose and placed in the sun, still smelling strongly, Rhody used it as a perch on which to stand and sun himself, evidently not objecting to the odor and having no associations connecting it with danger.

R and young. Rhody seems to be as much interested in the young birds (and as little parentally) as ever. He seldom, now, makes either of the calls formerly reserved for his children. In fact, today (24th.) it was Archie who used the goose-like call, inspired by Rhody's presence, as both manoeuvred about to get a better look at the other.

R and mirror. R absolutely ignores the mirror. The real birds seem to have usurped the place in his "imagination" formerly occupied by the phantom.

R's roost. R continues to roost at night in the same tree where ^{he} was found on the 17th.

September 25th.

Thrashers

No changes noted.

Road-runners

Moult. Archie is beginning to replace the moulted eye-lashes. (See later)

Bed-time behavior. As bed-time approaches, the birds become restless, just as they did when, as babies, they were allowed their liberty in the shop-yard.

At this time Archie is shy of Terry, even on the ground.

This evening, however, after both were in their accustomed places Archie apparently forgot about his experience when he climbed over the partition last time, and tried it again, with exactly the same result as that previously recorded. The partition will be raised.

September 26th.

Thrashers

Everything as usual, but Roughneck was present at the upper feeding station, and Brownie indulged in a long quarter-song at his night roost in the middle of the day.

Road-runners

Relations between A and T. Archie, sitting on my lap, saw Terry 15 feet away, back toward us, investigating a corner of the cage. He rushed up to him, pecked him once and "drew feathers". T did not retaliate. So far neither bird has ever been seen to return a blow.

Two or three hours earlier Terry had resented Archie's too great interest in a mouse that T was preparing to eat, and had dropped the mouse and made a short rush at Archie, causing the latter to retreat hastily.

The partition dividing the ~~two~~ sleeping place into two chambers was extended to the roof today. Terry noticed the change as

as he went to bed and appeared to study it critically and contemplate taking his old (now Archie's) place, but did not. The original partition, although it did not extend to the roof, interfered somewhat with the occupant of Room 2 getting the last rays of the sun and also with his view toward the west. The higher partition is still more objectionable in these respects--hence possibly, T's hesitation. Room 1 has not these disadvantages, but, in order to use the corner to best advantage for tail support and comfort, its occupant had to face away from the sun and the view to the west, unless he used the partition for tail support. Archie tried this arrangement, but gave it up, as I thought, because it exposed him to attack from the rear (from Terry) on account of the insufficient height of the partition. Therefore when I placed the new partition, I hoped that A would consider this ample protection to his rear and would then alter his position and face in the opposite direction in order to command the more extended view thus obtainable, if my theory were to be borne out. When he went to bed, he first took his usual place (force of habit?), but at 7:30 P.M., he had shifted to the expected position.

11 P.M. He is still in it, facing west, back to Terry on the other side of the wall. Really he has a much better place than T. (Incidentally there was another skunk in the box trap by the cage)

September 27th. and 28th.

Archie's new position mentioned in the last paragraph has not been maintained; at bedtime on these two days he faced east.

eyelashes. It was noted that Archie's new eyelashes have deciduous sheathes on them, just like feathers, which, presumably they are, although they are hairs in appearance.

Brownie's moult. Brownie is now immaculately sleek and silky in appearance, like a wax-wing. However, although no distorted feathers are seen in his left wing, there appears to be a definite gap in the place formerly occupied by them.

September 29th.

Brownie sang early and often and throughout the day at intervals. His full songs seemed more in the nature of calls or challenges for the benefit of distant thrashers, being somewhat staccato. At times Nova could be heard answerin him in her high voice.

Dr. and Mrs. Scamell brought Judge and Mrs. St. Sure, Judge and Mrs. Allen to see the road runners at 4 o'clock, some skepticism having been manifested in various quarters as to the reputed tameness of these birds. In fact, even as to their habitual presence in urban surroundings.

Curiously enough, just as the visitors were arriving, Rhody, whom I had not seen all day, seized upon the exact hour and minute to put in his appearance, but as he was coming to me for worms in the driveway, he was unable to stand the strain of visitors on foot approaching from the east, and, in a car, others from the west. Consequently he decamped, but with dignity, in the direction of his night roost, where I later pointed him out to two of my visitors, who, however, at 30 feet distance, were unable to distinguish him from the surrounding foliage, although I stood directly under him and gave them the exact distance that he was from the end of my

vertically pointing finger (about 5 feet). I had placed them where he could be plainly seen from the sidewalk through an opening in the leaves. I offered to go up and pull his tail, but Judge St. Sure was satisfied that he was really there! This illustrates very well the value of his protective pattern and coloration, and how these birds may really be more numerous locally than is popularly supposed.

Before this, I had taken the visitors to view the youngsters in the cage, one at a time, being fearful of the reaction of the birds to strangers, especially to women with their brighter and more flowing apparel. The birds, though somewhat restless, withstood the visitation well, even with four present at the same time. (Five including myself, in the cage). At this time of day, also, there are the voices of children to be reckoned with).

September 30th.

RR moult
first wing
feather.

The first moulted wing feather (flight feather) was found in the cage today. Also one of Terry's cut-off tail feathers was moulted-- also the first, except the two middle ones. (See notes 9/16-23)

October 1st.

Terry digs

Terry, today, exhibited an unusual interest in digging, using thrasher-like side sweeps of his bill. He dug several holes three or more inches deep, mostly at the side of rocks. A new manifestation

Arch and T refuse
mice.

Both Archie and Terry refused live mice today, although willing to play with them, but letting them go finally. Rhody, "of course", chose this time to show up, and was rewarded for his opportunism with both mice, which he stowed away successfully on top of meat previously eaten.

5th. RR pellet. Archie was seen in the act of disgorging a pellet of mouse hair -- the fifth seen to date. The action is exactly similar to the reaction to the human voice, frequently commented upon herein. This one, though not yet examined thoroughly, contains seeds of the pyracantha berries recently added to their bill of fare.

October 2nd.

Attitude
toward mice.

At about 9 A.M. both Archie and Terry had mice. T was eager for his, but A was not interested until I allowed the mouse to crawl under a rock. He would not look at it in the open. This attitude has frequently been noted on the part of both birds.

Moult of RR tail feathers.

Terry is now moulting the tail feathers which were injured in the panic of Aug. 25th. and which were subsequently cut off, leaving them about 4 inches long. The cuts were through the rachis and not the calamus. It is to be noted especially that Archie has lost none of these, despite the fact that, in all other respects as to moult, he has been in advance of Terry. This appears to be significant, especially when taken in connection with other observations, such as:

(1) Sometime between April 20th and 25th, last year, Rhody was caught (See notes of April 30, 1934) by a certain person, held for a day or so, until warned to release him. His wings were clipped during that period, as I learned from that person several months later, and verified myself when I caged him on May 31st. in order to protect the thrasher's nest.



Archie 4 months old; photographed
by Walter Moore.



Brownie, by Kathleen Dougan.

On June 14th. it was recorded that Rhody's flight feathers, in the last week had "emerged about 2 inches beyond the clipped coverts", showing, of course, that they were being replaced, and apparently in advance of the moulting season, though I have not checked over back notes.

(2) The broken middle tail feather of Archie was dropped long before moult began and completely replaced before the moult.

From the foregoing it would appear that a feather, injured only in the rachis, which would seem to be about the least vital part of it, is shed and replaced entirely independently of the moulting period. *See notes one 16-23*

Such being the case, it is difficult to see how the feather can be the inert, lifeless appendage which it is supposed to be when full-grown, unconnected with the vital processes of the bird itself.

**Curvature of
B's bill.**

3:30 P.M. For some time I have suspected that the curvature of Brownie's bill did not remain constant, so, just now, I observed it carefully as he sat on my lap digging worms out of the box. When the tip of the bill is definitely closed firmly, the posterior portion, beginning at the gape, is not closed for more than half of the length of the bill, perhaps three-quarters or more. That is the two mandibles have not the same radius of curvature, hence there has been a change in one or both, since hundreds of previous observations at close range have not disclosed this condition. My attention to this was first attracted by seeing the light through the opening a few days ago.

October 3rd.

No change amongst the thrashers.

Archie took the hanging nest as a roost for the night--the first time noted.

Neither A nor T were interested in eating mice during the day, although willing to play with them.

October 4th.

12:35 P.M. Brownie was fussing with twigs in the dormitory tree for the first time noted since the last nest was built. He also called Nova from there.

October 5th. to 14th., incl.

During this period Brownie was not again observed to work with twigs at the dorm, although on the 13th. after getting worms from me, he gathered up a sheaf of soap-root fibres, but dropped them soon after.

Singing continues about as usual from several directions.

Brownie wanders off to considerable distances in accordance with habit at this time of year, but always spends most of his time here, including roosting in the dorm.

Hawk raids are beginning again.

Road-runnersMoult

Terry has now moulted all but two of his broken rectrices; Archie none. (This is S for T).

There does not appear to be any moult of flight feathers, although over a period of several weeks, two have been found.

The "soft" feathers continue to be shed and there is still much work on the plumage in removing loose feathers and sheathes.

"Grooming"

Both birds like to be smoothed down gently with a stiff feather and will submit to the operation for an indefinite period, seeming to invite it, occasionally emitting soft "grunts" and nibbling at the feather.

Mouth color.

Terry is still behind A in change to black. Possibly he will never change so completely and this may be a characteristic sexual difference.

Sizes

T remains distinctly smaller than A and A is smaller than his father in every respect. As a rough, visual comparison, using a human basis: Terry is a "man" weighing, say, 150 pounds;

Archie

175

Rhodie

200 and more.

The birds have not been weighed since last record was made.

Sexes

These are still unknown.

Pellets

The sixth pellet has been found; again composed principally of mouse-hair. (Five days after the fifth one).

(the birds

Fear reactions.

A niece whom the birds have seen a few times at the cage, becoming only slightly restless), appeared in riding clothes on the 12th. Both birds immediately flew into a panic which subsided only after my niece retired to a distance out of sight. (Colors: Blue, olive drab(?) and tan leather).

A reclaims former

roosting place. Archie recovered his sleeping place from Terry by the simple process of getting there first and repelling attempts of T to enter it while A was in possession. T gave up after two attempts on succeeding days and ignores the place entirely, not even sleeping in the other room on the same shelf, but taking a new place made for him.

October 15th. to 18th., incl.

ThrashersDecrease in song.

This period has been marked by decided decrease in the volume of thrasher song, both by B and by other birds in the vicinity. Early morning song has been almost entirely stopped. It is so quiet during the day that, several times, I have wondered if Brownie had decamped, and have looked for him, usually finding him somewhere on the place ready to come to me for worms.

No nesting(?)

He has shown no further evidence of a desire to build a nest here at this season. I anticipated, last year, that his post-season, autumnal nesting activity would fade out to nearly nothing this year.

Roughneck

This bird has not now been seen for weeks.

B's wing.

The gap is still in B's left wing, with no external sign of its being filled.

Road-runners

- Rhody.** Rhody shows no tendency to diverge from recent habits, still using the night roost in the tree to the west, coming regularly to the cage and watching the youngsters--now silently--comments all being by the latter; ignoring the mirror as an attraction, though well aware of its presence, as he occasionally hesitates in front of it and appears to contemplate doing something about it, but does not.
- A coming to call.** Several times recently I have gone to the west fence and called to find if Rhody was there, and he has come out of the brush obediently and come to me--crawling under the fence--for food.
- A quiet.** He is now very quiet--no rattle-booming, no "singing".
- Moult.** A and T continue to remove loose body feathers and scurf, delighting to occupy me as a convenient perch while doing so.
- Getting new rectrices.** By looking under T's tail two new rectrices with white tips can be seen emerging. He still has two of the old, cut-off feathers.
- A not.** A has moulted none of these feathers. (~~When two old ones, Dec. 23~~)
- Hunger marks(?).** Both show some "hunger marks" on their rectrices, but fewer on their new ones than on their old. This is an indication of better nutrition than when they were growing their first feathers. (See Pycraft in Encyc. Brit., 11th. Ed., Art.: Feather). Before reading this article I had wondered what caused them, ascribing them to undue restriction by the sheath at the place where they occur, while the feather was still enclosed in it, thus causing malformation.
- Rhody does not show any of these marks. (~~data: He has a few~~)
- A and T plump.** There are times when both of the youngsters, in response to some stimulus not evident to me, stare off into the distance fixedly without moving their bodies, but showing no apparent fear. At such times they permit many liberties to be taken with them and one is able to explore their topography with the hands. They feel plump and solid with no sharpness at the breast bones at all, although the thickness of their breast feathers interferes somewhat with this investigation. This plumpness does not seem to indicate malnutrition though it would not be surprising if their diet were not properly balanced, considering the artificial conditions under which they are living. For food they have hamburger steak, into which a little fruit or vegetable matter is occasionally introduced, mice (which they now often refuse for a day or so); pyracantha berries in small quantities, some of which they get for themselves; snails from the garden (which they delight in cracking open, but seldom eating until they have dried to the consistency of leather); a few small slugs (which they catch for themselves, but do not like much, as being too messy); centipedes from the garden (which they prefer to angle-worms); angle worms (not at all favored and sometimes rejected entirely); sow-bugs, flies, yellow-jackets, spiders, moths and miscellaneous insects (which they are constantly chasing and killing, but often not eating for hours after they are dead); salamanders (the long, thin, wormlike kind, almost legless, caught for them by Julio); meal worms (a few every day); "soft food" (occasionally mixed with their meat, but refused "straight"); lizards (now scarce, as my local supply has become practically exhausted--thanks partly to Rhody). The bulk of their food is hamburger steak with all the mice they care to eat--an average, now, of less than one per day.
- Apparently happy.** They are lively, interested and tame and seem happy and contented and fond of the companionship of man. Short of liberating them, I can think of nothing to add to their well-being--and even that would be a doubtful kindness.

their greeting
action.

As previously noted they greet human friends by lowering their heads to the level of their feet and ma-ing (a as in hat). As with Rhody, this sound is heard on no other occasion--one wonders about its origin. They did not make it in the nest and Rhody proves that it is also an adult call.

Listening attentively, one distinguishes two simultaneous notes of different pitch, slightly dissonant, but pleasing and plaintive in quality. They do not keep it up as if begging for anything, but stop when the friend reaches them and often pinch a proffered finger, releasing it within a few seconds, then subsiding contentedly. It certainly does not appear to be a plea for food. Often they will make this call when one is at a distance and can not hear it, but can tell by the posture assumed that it is being made. On reaching them, it is found that they do not appear to want anything material at all.

"The" fly
on Archie.

It now develops that Archie (presumably also T) has these pests since one of them was seen walking around on top of his head. It looked just like Brownie's friend.

Reaction to
sounds.

These birds appear to react in some way to every sound that reaches them and seem to be listening to something all the time.

Watch ticking.

A watch was held to the ears of A and T. T first shook his head slightly in the nervous manner first noted when he was spoken to when very young, tried to eat the watch, then paid no attention to it while still held within an inch or so of his ear. A's reaction was the same, except that he did not shake his head first. Neither was annoyed by its color (gold).

Reaction to
gold nil.

Eye patches.

Archie's skin patch still seems to be a deeper shade--though but slightly--than T's. I can not detect any change in the faded apricot portion, still far less colorful than Rhody's.

"Halo"

Bird books speak of the bristles that project beyond the feathers of the head and neck. On A and T these are very fine and soft, not at all like bristles. When touched lightly I can not feel them. They can be seen distinctly only against a light back-ground and then it is seen that they cover not only head and neck but shoulders as well. When lighted from the far side they appear as a halo and are surprisingly numerous.

October 19th.

Jays mob a
screech owl.

At intervals of a few hours during the last three days, California jays have gathered in an oak near the eastern boundary line of this place, and scolded raucously, gathering many different kinds of birds to lend a hand at whatever was afoot. These birds were kinglets (but recently arrived), the two kinds of towhees (8 or 10 of the Brown), a thrasher or so, goldfinches, wren-tits, plain titmice, Nuttall (and/or Gambel) sparrows, etc. When I have gone out to look, the jays have always fled, leaving no clue as to the focus of infection. Repeated search has revealed nothing.

Brownie takes
part as a
Steller jay.

At about 7 P.M. they were at it again and, mixed with the California jay cries, the harsh scolding of the Steller jay could be heard a little apart from the main group. To my surprise it was Brownie who was the "Steller jay"--his first noted example of this particular cry. Prolonged search revealed a little screech owl, tucked away amongst the leaves near the tip of a high branch, as the cause of the disturbance.

5:30 P.M. They are at it again, but B is taking no part.

Panic of A and T.

About 3 P.M. I approached the cage with four visitors, two men and two women. The youngsters got panicky when we have in sight

In striking contrast is an example afforded by Archie this afternoon. He was on the floor staring at the magpies. I reached down and took him by the body lightly (so that he could escape if he cared to, without struggling). I then moved his body about in a small circle without upsetting his equilibrium or causing him to shift his feet. During this movement he kept his head absolutely fixed in space. (A characteristic of all birds that I have ever handled, including the domestic hen, as long as the amplitude of the movement does not exceed the length of the neck--approximately). Next I raised the tips of his wings above the root of his tail where they "ought" to be. He kept them there. I then parted his ear coverts on one side in order to locate his ear and, at the same time find out the extent of the lower blue band of the skin-patch. (This is practically always covered by the ear coverts even when the skin patch is being displayed--in the case of Rhody as well as the youngsters). Next he was groomed all over, gently, with the hand, then lifted up bodily (by the body) with legs hanging down like a crane's. I tucked his feet in under him and then carried him about the cage as long as I cared to. During all this time he did not once flinch, struggle, utter protest or try to get away.

A little later Terry was on the same spot, but with his attention fixed on nothing in particular. I enclosed his body with both hands lightly. When a little more pressure was put on, he shifted one wing into a more comfortable position, puffed out his head and neck feathers, let his weight come upon my hands and was prepared to spend the rest of the day there.

I was surprised myself at Archie's allowing me to hold him clasped in my hands, this has never been done except when he was a mere squab several months ago. In the present instance he was, of course, before I took him up, not exactly frozen, but at least in one of his more or less wooden fits of abstraction. Ordinarily if I wish to hold one of them, I touch his feet and he then immediately, in an absent minded manner, steps on to my hand if standing on a flat surface. or. if on a perch, he includes a finger in his grasp. He then will jump on to my shoulder or else sit on my hand and allow himself to be carried about.

Today each of them had one of the few lizards remaining on the place. True to road-runner habit, each played with his lizard a long time before eating it, by laying it on the ground and apparently abandoning it, but walking about it in a circle with an air of indifference and not appearing to look at it. but acutely aware, nevertheless of its slightest movement. The lizards are, of course, adepts at the game of playing 'possum, but when they think there is a chance. suddenly bolt at high speed. The road-runners are after them like a flash and seem to make it a point of honor not to catch them until they are within a small fraction of a second short of being safely under a stone or out of the cage. These birds will do this with any living thing and sometimes try it even on inanimate objects as well as dead creatures. The lizard, however, seems to furnish the best sport; better by far than the relatively sluggish. half tame. reared-in-captivity mice which I give them.

It is only when the birds are extremely hungry that living things. offering possibilities of sport. are killed at once. All kinds of chances are taken and the birds not infrequently lose

their quarry, necessitating my coming to the rescue.

October 21st.

B quiet.

The quiet period among the thrashers continues; occasionally a little sub-song by Brownie, but is quiet for the most part, loafing in the shade, with no apparent interest in nesting.

Rhody

Rhody on the job as usual, still voiceless while inspecting the youngsters, the latter doing the talking.

T loses wing feather Terry moulted a secondary flight feather; the first definitely traced to its source and the third one found. All of these may have been shed as a result of accident and not necessarily by normal moult. (Probably accident - see 23)

A and T have no conception of number.

Here is a typical performance of either Archie or Terry that seems to indicate that they have no conception of number whatever. For example a mouse runs under a stone and one or both try to get it out. To simplify the illustration, let's say Archie alone is after it. He either gets it himself or I get it for him. He may turn it loose or eat it or merely glance at it, but in any case, he usually, immediately after, begins to look under the rock again, even though the mouse may be in plain sight outside and notwithstanding that he had had no interest whatever in the rock before he saw the mouse go under it.

October 22nd.

A and T and wind.

Like the thrashers, Archie and Terry are afraid of the wind even when they are not exposed to it and listen acutely to all of the mysterious sounds due to it, becoming very restless. Late this afternoon a strong wind came up, the first that they have experienced.

A, T, Brownie and R observed on windy night, 9 P.M. A powerful wind is blowing from the north, striking the house with great force and causing the trees to roar. The eucalyptus trees 250 yards to the east sound like a train going over a bridge, and pine needles are gathering in drifts. I went out to see how my proteges are bearing up under it. (Temp. 59).

Archie and Terry are lying quietly in their beds.

Brownie is snug behind the wind screen at the dormitory tree, but swaying about somewhat.

Rhody in his tree on the bank to the west seems to be getting the full benefit of it, and with the aid of a flash-light, can be seen swinging about but holding on manfully. Curious how he prefers a strategical position to comfort. I wish he would accept civilized shelter as B does.

October 23rd. to 26th., incl. (Note written 27th.)

No changes during this period amongst the thrashers and road-runners.

It continues to be a relatively silent time for the thrashers and Brownie has not been so conspicuous as usual, though in his regular roost every night.

Rhody continued to occupy his present roost.

I asked Dr. Emlen who talked before the Cooper Club on the night roosting habits of birds, whether in his experience, the sol-

itary-roosting birds showed any tendency to occupy the same roost habitually, and was somewhat surprised to have him reply in the negative. This is directly contrary to the observed habits of Brownie and Rhody here.

As a rather curious coincidence, on the evening of the 26th. I noticed an Anna Hummingbird alighting on what appeared to be its night roost, just outside the western living room window, about sunset. I turned a flash-light upon it at intervals up to 10 P.M. and found it there each time. I shall watch this bird (or the place) to determine whether it returns.

October 27th.

6 P.M. The humming bird is again on the exact spot occupied last night--a short, bare, fine twig of an oak, not at all concealed from almost any direction.

This morning when visiting the road-runner cage, two flight feathers were found on the ground. Then head and body feathers, not there yesterday were found scattered all about in clumps of five or six, adhering by their quills. I looked into Archie's night roost and found feathers scattered all over and droppings smeared on the "blanket" and the glass. (These birds have always been particularly tidy about their sleeping places). My first thought was that A and T had had a great fight over the eastern end of the shelf (p.1042) which has been a repeated cause of friction. Archie was found to have lost a considerable patch of feathers from his head, but had no cuts. Terry had cut his forehead badly and there was also a small cut on the rear end of one of his eye-patches, but the two birds seemed friendly enough. On second thought I decided that a cat had frightened them in the night since there were other evidences pointing to the presence of such a marauder.

However, at bed-time tonight, I watched the birds. Archie was the first to show signs of wanting to go to bed. He jumped up, took one look into his regular "room" and departed at once, thereafter showing no further interest in it whatever--a most unusual circumstance, taking instead the hanging nest--a place which has hitherto found no favor in his eyes. Terry, who, since he was ejected by Archie, has occupied a new place made for his especial benefit nearby, would not go to either end of the shelf, his new place, or any of the other places made especially for roosting places, except that he wanted the hanging nest too, so, twice he jumped up on top of Archie, each time was ejected after a sharp, noisy scrimmage and sought roosting places outside in Cage C where they have never been permitted to spend the night. Terry tried every location there that looked at all promising and, as it began to get darker, plainly became less accurate in his judgement of distances. I finally rigged up a temporary affair for him in Cage C which he took at once, apparently satisfied for the time being. Archie continued to occupy the hanging nest during all this without leaving it once. (He usually is in and out several times). During the scuffles he had spread his tail, and when I left, it was still spread; usually it is compactly folded, about one feather wide.

Now I do not know what to think; whether the loss of feathers was due to a dispute over the sleeping place or to panic induced by a cat (or a hawk, or an owl).

Why have the accustomed places suddenly become taboo?

Why is it that Archie and Terry suddenly want the hanging nest, when neither wanted it before?

What is wrong with all of the other places, especially those that were so highly prized before?

Why did Archie, after one look into his accustomed bunk, depart so hastily and avoid it thenceforth? Was it a sudden recollection of an unpleasant experience there? Why did not Terry take it? Why did T not take his (now) usual bed?

7:15 P.M. (Temp. 63). As the day was rather warm (the birds panting), perhaps the hanging nest was desired as a cool spot.

In any case, it looks, now that the birds are growing up, as if the road-runner, certainly never a gregarious bird, is intolerant of the presence of others of its kind and that these youngsters are afraid to appear. (Yet they will sit side by side in the daytime in perfect amity).

Reaction to visitors.

This morning A and T became nervous and frightened when Dr. and Mrs. Reynolds and their little daughter approached with me. Yet they are not afraid of the Doctor.

This afternoon four of us (all men) approached the cage, the birds becoming nervous at once. When I approached alone, they were not afraid. I had the others come slowly, one at a time. They were frightened as each appeared, calming down somewhat between appearances. Finally about a half hour after all were seated nearby they became almost normal.

More numbers frightened them.

Terry is frightened easier and worse than A, but he gets over it sooner.

Terry is the more timid bird, but, curiously, will become reconciled to the presence of a stranger in the cage and become familiar with him long before Archie will tolerate his presence at all.

Yet Archie is the one that "uses" me most.

A cat is caught. 7:35 P.M. I am swinging back to the cat idea as to the cause of last night's trouble--since I find we have one in the trap now at the cage. A and T were in the same places as when I left them about 6 P.M. The cat had evidently not frightened them, going directly to the bait (bacon). He was promptly shot and the trap set again.

Wind (See p. 1077) It now appears that the wind of Oct. 22nd. was the heaviest by a wide margin since the local records began 62 years ago. Archie and Terry, in their short careers to date, have experienced to record meteorological performances: this wind and the August rain.

Brownie has a bad "cough". Brownie, as stated, has been rather "scarce" these last few days. When, this afternoon, Mr. Brock and his two friends wished to see him, I thought it was doubtful if he would respond to call. However, we went to the oval lawn and I whistled his bugle call a few times and he shortly appeared "coughing": pip, pip, pip and seemed unable to stop. He trotted across the lawn to us and jumped to my hand to the great delight of my visitors. He continued his pipping between worms. To him this must rank as a racking, painful cough, for I noticed that with each pip he gripped my finger tighter. When he went away he was still coughing.

Hummingbird still in roost. 11 P.M. The humming-bird is still on the same roost, about 8 feet from the window and below it, facing it. It is just a little, round ball about the size of a walnut with no apparent head, although its crimson throat patch is conspicuous. It is not disturbed by the beam of light. Quail are sleeping in their regular roost 8 to 10 feet from it in the next tree. It went to bed last night just as the quail were doing likewise. That is how I happened to find it.

Calibration of kitchen scales to
 read 1 g - allowing for errors
 of scales

$$CZ = 28.35g$$

$$By\ scales = 29.0g\ mean$$

$$N = 3.35$$

Indication in g

60
50
40
30
20
10
0

200 400 600 800

Birds here today:

These birds were seen here today (outside the cage), or heard

Vigors wren,	Western robin,
Red-breasted nuthatch,	Red shafted flicker,
Wren-tit,	Brown towhee,
Bush-tit,	Spotted "
Plain titmouse,	Gambel and/or Nuttall sparrow,
Screech owl (now calling),	California jay,
Ruby crowned kinglet,	Golden crowned sparrow,
Hermit thrush,	House finch,
Fox sparrow,	Purple finch,
Green-backed goldfinch,	Anna humming-bird,
Willow goldfinch,	California thrasher (Brownie),
Pine siskin,	Road-runner (Rhody),
Junco,	Quail.
	Night-hawk.

These were all seen casually, no attempt being made to determine how many kinds could be found on the place. The list is typical for this season, but does not represent by any means all the kinds that are to be found here at this time of the year, many of which probably were here but not seen. (27 in above list).

October 28th.

Road-runner
sleeping
arrangements
still disturb-
ed.

Sleeping arrangements of the young road-runners continued to be upset. Archie took the hanging nest and Terry wandered about like a lost soul trying to find some place to sleep in the outside cage until long after his regular bed-time. He did not try any of the old places at all and ignored the temporary bunk made for him last night. He tried all of the exposed corners outside where there were perches, putting his tail up against the wire; a dangerous procedure. Once when I held my hand up against the wire like a shelf, he promptly composed himself there for a good night's rest: tail braced against my fingers in approved fashion. This was perfectly satisfactory to him but awkward for me. By this time it was dark and he could not see well enough to continue his explorations. He was then moved over to the temporary resting place, but tried to perch on my glasses in the process, unintentionally drawing blood from scratches made on my face by his claws.

There was no quarrel with Archie, who viewed these proceedings complacently from his comfortable bed. Archie would not even look at any of the other places formerly occupied. There seems to be a hoodoo on them.

Humming-bird not
at his roost.

The humming-bird is not on the roost where seen the last two nights.

October 29th.

No change from the 28th. as to road-runners and humming-bird.

B still has his
"cough".

Brownie still pips, but less frequently than when first noted. Probably he has a cold.

October 30th.

Low temp.
(Record).

The lowest official temperature recorded on October 30th. in the 62 years during which records have been kept. (Min. here 43).
At lower elevations 7 or 8° lower

I have been raising the roof at one end of the road-runner cage 3 feet and in this space growing branches of Acacia melanoxylon and Acacia longifolia are to be brought from the trees at the end of the cage; this will give the birds choice of a roost in the branches.

*See P. 1135 A for photo of cage with this addition
(also Rhody on top of it)*

A and T not disturbed by hammering. It is very noisy operation, yet Archie and Terry, instead of being frightened by the hammering and walking over their heads, do not mind it in the least; in fact they frequently get as near to the work as possible and watch curiously. Sometimes this is not over two feet from where a nail is being driven.

B's song increasing again. **Brownie** is now apparently beginning a new song cycle. (Though only time will determine). Others noted the decline in thrasher song in this general vicinity coincidentally with B's lessened singing activity. Thus it seems to be common to thrashers in this neighborhood. (The days have been warm and sunny).

Archie's gorman-lizing feat. At about 3:30 P.M. Julio brought lizards and water-dogs (newts) for the road-runners.

Archie first ate an alligator lizard about 12 inches long, having a hard time to kill it and, contrary to his usual habit, took no chances on its escaping. Terry was given a salamander (newt)--one of the heavy, thick-set type, but he preferred to gobble the fragments of the lizard's tail as they broke off under Archie's ministrations. T abandoned the salamander (about 6 inches long) and Archie, much to my surprise, took it in "hand" and swallowed it neatly. A small lizard (about 5 inches long over-all) was also abandoned by Terry, so Archie added this to his bag, "A" next followed up by eating a centipede and when he saw Terry sitting on my knee eating meal worms, decided that he wanted some too and took T's place. After this he tackled a small salamander that Terry would not eat (about 4 inches long). After worrying it about he made two attempts to swallow it, but had to give up. This was all accomplished in less than a half hour. Archie has never been so greedy before and there was plenty of meat in the cage at the time.

Bed-time doings. The old sleeping places are still taboo; the birds will not enter them at all. Archie takes the hanging nest and Terry tries every other possible location until darkness forces him to make up his mind. Tonight I limited his choice by closing the door to the outside cage and he eventually settled in the place that he had been occupying regularly since Archie ejected him from his preferred location. It is strange that during all this hopping in and out of prospective sleeping places he did not once consider either of the beds which were so long favored, shown in sketch on p. 1042. He must have gone in and out of various places at least thirty or forty times.

It would be interesting to know whether the avoidance of these quarters is a result of the cat-disturbance of the other night or whether it is based on the friction which has arisen between the two birds over them.

Soft feet of road-runners. **Whenever these birds** clasp a finger with their feet I always wonder at the extreme softness of the pads under their toes. Others have commented upon this without my having called it to their attention. One would expect such noted runners to have calloused feet at least, but such is not the case.

Indirect confirmation of this softness is evidenced by the rather frequent inspection which they make of their feet. The sharp leaves of the acacia armata (Kangaroo thorn) get into the cage and bother them, so I had one of these trees that was next to the cage in a windbreak, cut down today.

Hummingbird roost unoccupied. The humming-bird was not on his roost tonight. It looks as if the previous occupancy was merely temporary.

October 31st.

B's song revival continues. Brownie sang full song frequently during the middle of the day, although he was not heard early in the morning. There appeared to be no answering song in the distance.

B's cough. When he came to me for worms there was once or twice what appeared to be an involuntary noise in his throat as he reached for my offerings. He also pipped once or twice, but his cold is getting better.

Road-runner bed going. This duplicated last night's behavior, neither bird even looking at their old places. They have so little fear of me that Archie took the hanging nest at a time when I was standing directly over it on the roof with my feet not over a foot from his head, supported by a narrow board laid on the wire netting. where he could see me plainly.

Hummer back again. Well, the humming-bird is on his "regular" roost now (8:35 P.M.). I looked twice before this and did not see him. (I.e.: Twice this evening after dark). Perhaps he has other roosts which are occupied or not according to the direction of the wind (if any), etc. Possibly, also, he has been there other times when I looked. It is easy not to see him. He has shifted about six inches from his first roost, but on the same twig.

November 1st.

RR attitude toward rain. About noon a gentle rain began falling. Archie immediately got out from under cover, spread his wings and tail, as he does when performing the spread-eagle sunning act, and sat in the rain. When I placed a screen over him, outside the cage, he moved out from under it and displayed again. Now and then he shook himself to remove the accumulated drops on his plumage. Terry remained under cover as long as I watched.

Once again Archie has shown a more positive character than T. When Rhody stands for a long time with the water streaming off of him, when there is shelter available, it is apparently not because of stupidity, but because he likes it.

Since these birds are dusters and not bathers, perhaps this action is deliberately intended to supplement dusting as a means of cleaning the plumage. (See Nov 7th notes)

Early song by B. Brownie has resumed early morning song, or else he has been singing without my having heard him, which is quite possible. He sang at intervals throughout the forenoon also.

RR bedtime. At bedtime. A and T again avoided their room, A taking the hanging nest and T, after his, now, usual prolonged inspection of all potential roosting places, finally selected the one that is about 5 ft. north of the S.W. corner of cage B--call it NO. 4-- I do not understand what has come over these birds, unless, now that they are approaching maturity, they wish to be far apart when sleeping.

Humming-bird. The humming bird was not seen at his roost. Perhaps the storm of last night--which the papers again refer to as a "record"--was the cause. Certainly it was windy and wet.

November 2nd.

RR disturbance. Something again happened in the cage last night or early this morning. About 7:45 A.M. Julie found Terry jammed against the

wire netting behind the glass which forms the back of the sleeping place. (P. 1042), trying to get out. Julie had to take him out. When I went out I found T's forehead and chin bloody and four of his tail feathers on the ground, two new ones and the remaining, cut-off old ones. (Incorrect--see Nov. 4th. notes).

Archie was partially bald and, after search, I found the missing feathers adhering to the roof wire in a clump and marks of the birds' feet on the glass. The top of his head cut.

Meat outside and in the cat-trap had not been touched, so it does not seem to have been a cut episode. I again suspect internal dissension, despite the fact that the birds were perfectly calm when I saw them and remained so all day. (I was working on the cage all day, until it became too dark to see clearly). Not once was there any friction between them during this period.

Just before dark I arrived at a point--or rather I reached the point at about their bed-time--where it was necessary to remove some of the netting from the top of cage B; consequently they were forced to remain out in cage C until dark. When I opened the door Archie entered at once and went immediately into the hanging nest and settled himself for good with no jumping in and out. Terry remained outside on top of Door 2 which was swung out into cage C. I went to him, touched his feet and he jumped to my shoulder. I then walked into cage B, backed up to his bed (No. 3) and he jumped into it, backed up against the wall with tail flattened against it and there was no more monkey business from him either.

All of this is most puzzling. Perhaps it means separating them at night. We shall see what effect the extension has, with its growing branches and greater privacy--i.e.: if they will use it.

Humming-bird.

7:30 P.M. It is clear and calm. The humming-bird is back on his roost again.

A eats millipede. Archie, today, ate a "thousand legger" (millipede). I have seen him refuse them. I do not recall having seen him eat one before?

Bright yellow feared? I overlooked recording yesterday that when Julio approached the cage wearing a bright yellow sou'wester the birds became restless, looking for places to hide. I had him remove the hat, go away, then return without it. They accepted his presence at once. As a guess: It is the yellow-orange-red end of the spectrum that frightens them.

November 3rd.

Early song by B. Early song by B and a little during the day.

Display of confidence by A. This morning when I was putting up roosts in the addition to the cage. Archie insisted on roosting on me while I was hammering and locating the perches. He even sat on my upper arm during the actual driving of nails. When "shooed" away, he moved to the top of my head. At times, when levelling a perch, he would sit on it and interfere with my work. He would sit on a perch while one end was being nailed. In the small space where I was working the noise of the hammer was reenforced by resonance and anything but pleasant, yet he showed not the slightest sign of being disturbed by it. He really was a nuisance, crawling all over head, shoulders and arms, raking his tail across my nose and the back of my neck and getting his feathers in my ears. yet I was delighted by his confidence that no harm would come to him.

Hummer on roost. At 6:30 P.M.: clear, mild and calm. The hummer was on his roost.

Hawks cause of disturbance?

There is, of course, a possibility that a hawk or hawks may be responsible for the disturbances in the road-runner cage. This morning, at 7:30, a Cooper or a Sharp-shinned hawk was sitting on a snag of the old oak 20 or 30 yards from the cage, which was in plain sight of him. The road-runners, however, either did not see him, or else were indifferent to his presence.

B sings early.

B was heard singing a little about sunrise.

RR tails. (Correction to preceding notes).

See top of p.1083. This morning, on carefully examining the birds and the feathers found day before yesterday morning, it was seen that one of the tail feathers was an old one of Archie's; the other a new one of Terry's, still pulpy inside and still with the deciduous sheath on the quill. The other was from Archie's right hand side. He has now only five white spots underneath his tail. These feathers are rights and lefts and easily identifiable as to location. Also the birds allow me to fit them back in to their original locations approximately. 2

It was also found that Terry still has one of the old broken-off rectrices. By parting his feathers it is seen that he has only three white tipped rectrices.

any consequences

These birds have ten rectrices. The two middle ones are the longest. The three outer ones on each side are the only ones that have white tips. These tips show only from below normally, but when the tail is displayed, then show from above.

Translucent lower lids.

While Terry was sitting on my hand this morning removing "dandruff" from his feathers, I helped him by blowing it away. When he reached back for oil he partially closed his eyes, as these birds always do when making a long reach thus. It was easy to see that the lower lid is semi-transparent, notwithstanding its slaty hue, because the brassy ring about the pupil plainly shows through.

As the bird, when sleeping, closes its eyes mostly with the lower lid, it is evident that, unless the eye balls are rolled downward (or upward) too far, the bird is able to distinguish fairly moderate differences in the intensity of illumination of surrounding objects, and therefore, probably also moving objects.

This seems to be intended as a measure of protection.

I have watched them as they doze off and although I am not sure that it is invariably the case, they eye-balls are rolled downward below the waking position. If the human eye is rolled upward under similar conditions, it seems logical, considering the difference in the action of the lids in the two animals, that the road-runners' should roll in the reverse direction.

Archie's bill.

The decurved tip which has replaced the one that was broken off has not yet quite extended down to the level of the under side of the lower mandible.

Terry's bill.

The tip, as in Rhody, though not so pronouncedly, extends below the lower mandible. Terry never lost this tip, although, as herein noted it was damaged. Consequently the surmise that these tips are normally deciduous was not correct. The thought was that the juvenile tip might be replaced by an adult one of tougher texture, as a regular thing.

Humming-bird.

7:35 P.M. The hummer is on his regular roost and has been there since darkness fell. (Clear, calm). This looks like a habit.

November 5th.

At about 8 A.M. I went to the cage. The young road-runners

reaction of were at their customary early morning observation post: The perch
and T to hawk.

which is fastened to the inside of the entrance door. (Door 1).

Instead of lowering their heads at my approach and whining as is their usual habit at this time of day, they were frozen and looking off into space unwinkingly. I searched the sky, but saw nothing. A glance at the old oak--at which the birds did not seem to be looking--revealed a Cooper hawk on the topmost snag. He accommodately waited until I could get a gun from the house and kill him. I showed him to Archie and Terry, who were still frozen in the same spot. They thawed enough to turn their heads and follow the dead hawk as he was moved about, but exhibited no special fear. The magpies, however, who will yell at a feather, scolded harshly.

Brownie This was a very quiet day for Brownie.

Humming-bird. 6:30 P.M. The hummer is on the same night roost. (Clear, calm cool).

Temperatures. It is a fact that record low temperatures for this time of the year are being recorded all over California. E.g.: Sacramento, the lowest in 80 years, 30. Riverside in the citrus district of southern California, 32. Oakland Airport (in sight from here), 30. Here, 39. (This illustrates the effect of elevation). Max. here during the day, 62; min., 39; now, 6:40 P.M., 52).

November 6th.

9:45 P.M. (Temp. 54; Max. during day 64; min., thermom. not set).
A shifts roost. Archie has changed his roost to a new place provided for him in the cage extension. This "bed" was placed after noticing his preference for the location last night. He was on a perch in a corner in a most uncomfortable position settled for the night. A bunk was hastily made for him; he was raised and the affair slipped under him without causing him to leave. He is in it tonight.

T changes also. Terry changed to the hanging nest tonight, having presumably determined to his satisfaction that Archie was not going to use it.

Hummer as usual. The humming-bird is in his regular roost.

November 7th.

Hummer roosting The sun's disc was bisected by the western horizon as I reached the vicinity of the humming-bird's night roost. Just as the upper edge disappeared there was a whir of tiny wings and the hummer suddenly landed on his regular roost for the night.

I moved down to Rhody's tree. He had already retired and sat with bill pointing directly toward the sunset point, now well south

of west.

A and T.

The young road-runners had taken the same positions as last night.

Brownie not in dorm.

Brownie was not in the dormitory tree, nor could he be seen there at 11:45 P.M. As it is a warm night, he may have taken his alternative roost in the acacia, but it is almost impossible to see him there after dark.

Archie repeats rain reaction with saw-dust.

A curious reaction of Archie's duplicating his behavior toward rain noted on the 1st., was observed while Julio was sweeping saw-dust off of the roof of the cage. As the dust began to fall about Archie, who was standing in the open below, he bowed his head and spread his wings to catch it!

(Max. during day, 69; Min, 49; temp. at 11:45 P.M., 56).

RR tail-shaking.

The tails of the road-runners are so long and flexible and they have such good muscular control over them that, like the black-billed magpies, they can shake them rapidly without moving the body at all, causing a series of waves to begin at the base and run out to the tip where, presumably, they are broadcast into space.

November 8th.

B back in dorm.

Brownie returned to his regular night roost a little after sunset.

Hummer

The hummer occupied his regular roost.

A and T.

Archie changed back to the hanging nest at bed-time. This left Terry again at a loss where to sleep. Twice he approached Archie as if to climb into the nest with him, but was repulsed each time, the second time Archie pulled a billful of soft feathers out of him. There was no outcry.

A pecks T.

I then induced Archie to take up his new resting place in the extension, but Terry had already reconciled himself to his usual second choice.

10:35 P.M. (Temp. 49). A and T are as I left them at night-fall, the hanging nest being unoccupied. (Cloudy).

November 9th.

Speculation on binocular field of view of road-runners.

I have often wondered if the fields of view of the two eyes of the road-runner overlap, and if so: where? Especially: Can he see the end of his own bill? If the fields of view overlap, one would assume that he has binocular vision, though perhaps unwarrantably.

It is a little difficult to make measurements of a living road-runner that is perfectly free--not held, even when he is as confiding as Archie and Terry. However, I did measure Archie's length of bill and distance between eyes; although he did not object, he wanted to nibble the rule and find out what it was all about. I have always noticed the extreme mobility of the eyes of these birds and that they can direct them well towards the front. Looking at the bird face to face at a distance of, say a foot or so, one is able to see (even with one eye closed) both pupils and the surrounding brassy ring in their entirety. Both are circular, but necessarily appear somewhat elliptical, due to foreshortening, when viewed as above. The amount of ellipticity is, however, surprisingly small. At various times I have guessed at the angle which the optical axis of the eye makes with a line drawn through

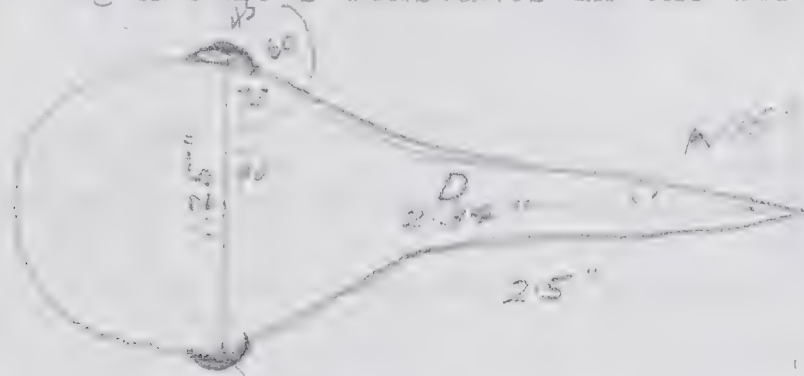
the centers of the two eyes, when the eyes are directed forward and converged upon a close object. I believe this angle is about 45 degrees.

The two eyes are about 1.25 inches apart (Archie) and from his gape to the end of his bill is 2.5 inches. (About 32 mm. and 64 mm., respectively).

The article, Vision, in Encyc. Brit., 14th. Ed. by Sir J.H. Parsons gives the angles of the field of vision of (presumably) the human eye around the point of fixation as: Outward, more than 90 deg., downward 70, inward 60, upward 50.

In the present instance we are concerned with the inward angle: 60 degrees, although it is not necessarily true that the road-runner eye has, in this respect, the same characteristics as the human eye. However, this note is only a speculation.

Putting Archie's constants in the form of a diagram, we have:



From this it will appear that with his eyes inclined forward at a 45 deg. angle with the line joining them, the inner edge of the field of view will intersect the axis of his bill at an angle A which is about 15 degrees. (His gape is directly under his eyes).

The distance from the point midway between his eyes (or what is sensibly the same thing: his gape) to the point of intersection of the inner edge of the fields of view of his two eyes is:

D ; equals one half the distance between his eyes times the cotangent of the angle of 15 degrees, or:

$$D = 0.625 \cot 15 \text{ deg.}, \text{ in inches.}$$

$$= 2.34 \text{ inches.}$$

As his bill is 2.5 inches long, he can then see with both eyes 0.16 of an inch of the tip of it!

have its image
 If a small object in the tip of his bill, then, will be impressed on corresponding points of the retinae of his two eyes. Hence, presumably, he will have binocular vision of it.

The field of view at that point, i.e. the binocular field of view at that point (the tip of his bill) is a small lens-shaped field like this:



From there on outwards to infinity it is enclosed within a cone of the above form of cross section, having an angle of about 30 degrees. Outside of that field, at least geometrically, with his eyes in this position, vision would appear to be monocular.

(This is all speculation and is too rough to base conclusion on).

Bed-time.

RRs.

Archie took his new roost, Terry the hanging nest after again trying every other likely looking spot, including myself.

Hummer absent.

About sunset I went to see the hummer arrive, but he did not then or later.

November 10th.

Hummer in same roost.

At exactly 5 P.M., the sun was partly below the S.F. hills. The hummer was already settled on his roost, back toward the sun, facing the window--just the opposite of Rhody.

I made the rounds finding:

Rhody.

Rhody in his regular roost, facing west.

Brownie.

Brownie in the dorm--a little early for him.

Archie.

Archie lying on his new couch in the extension; he had been there since 3:30, although it was calm, fair and warm.

Terry.

Terry in the hanging nest.

Archie and I have contest for lizzard.

Earlier in the day I gave Terry a lizzard, but Archie stole it while T was parading around it in road-runner fashion, and ran off. When he laid it down and began circling about it, I reached for it, but A snatched it and ran off again. This was repeated several times, each time Archie waiting until I caught up to him and giving me about an equal chance with himself. He was not at all alarmed by my snatching at the lizzard although he and T normally are frightened by quick movements. Several times my hand and his bill collided, but he always won. Finally he allowed me to take it without reaching for it himself. I then gave it to Terry, but A again stole it. This episode was repeated also several times. I really believe Archie was playing. Terry finally became annoyed and on an attempt by A to pick it up from under T's nose, T turned on him like a flash and caught him by the bill. A ran away squealing. In a few minutes he returned. This time Terry had the lizzard in his bill, but he dropped it and again seized A by the base of the bill, with the same result. A pressed the matter no further and T ate the lizzard in peace. This is one of the few instances where Terry asserted his rights fearlessly, without regard to consequences. As a matter of fact, curiously enough, affairs like this never seem to have any "consequences" as the bird attacked has never been seen to resist. No doubt the element of surprise enters here, as these affairs develop unexpectedly and seldom.

Terry punishes Archie.

Road-runner Eyes

Age of A and T.

A and T are now 5 and a third months old.

Fluorescence

Some weeks ago it was noted that the fluorescent appearance of the pupils had disappeared entirely. However, at times, it can still be faintly seen.

Eye shine.

Today eye shine was observed for the first time in either of the young birds, although it has been seen in Rhody, and under the same day-light conditions. This time it was Terry, standing in my shadow (with pupils expanded?). I moved slightly and the direct rays of the sun struck his eyes momentarily causing them to give out a metallic, coppery-red glow for an instant.

Although a flash-light has been turned upon these birds often at night, I have not seen the eye-shine at night.

Eye colors.

Beginning at the pupil and proceeding outwards:

(There have been some changes since last recorded observations).

Ring about pupil. First comes the ring surrounding the pupil, now distinctly brassy in hue. It is noted that the outer circumference is not what the botanists would call "entire"; it is serrated, so that the ring looks, at close range, like a gear wheel with irregular teeth.

Change in iris. The next portion of the iris is dark brown but towards the edge it has now become lighter in hue--very much lighter in fact--and has a lavender tinge in it.

Sclerotic coat. The sclerotic coat (I suppose it is that--beyond the cornea) is not white as in human eyes, but brown again

Skin patch. The skin-patch back of the eye has not changed in its colors in any noticeable way since last observation was recorded. The "red" is still dull and faded in appearance--it almost seems duller.

Lashes The moulted eye-lashes have been completely replaced. They are now no longer "white" at the inner ends. (To be confirmed). *OK*
They still are not directed downward. They curve to the rear.

Lash spectrum. Viewed at close range under intense illumination, each lash is seen to give off an impure diffraction spectrum.

Other Characteristic RR features.

Halo. The halo formed by the fine hairs that project beyond the feathers of the head and neck also, when viewed under strong illumination give off spectra. The hairs are close enough together to cause these spectra to blend.

"Beards" The long hairs under the chins have been undergoing replacement and are still covered for about a third of their length by sheathes. These "hairs" are nearly white, *but some are black.*

A's bald spot. In the eight day period that has elapsed since Archie scraped off a considerable portion of his head feathers new ones have grown out about one eighth of an inch (3 mm. plus).

Hroo call ceases Some time ago it was noted that, first A then followed later by T, had acquired the soft, low, pleasing, adult hroo. This has not now been heard from either bird for some weeks.

Tongue tips. First the tongue tips were pink, then "black" ; now they are almost white and look like horn. This was first noted in Terry who had swallowed all but the tail of a mouse. The tail stuck out one side of his gape and his tongue was crowded out the other.

Bill tips. These have changed in color, from bluish-slaty to yellowish-white horn-color. Presumably becoming harder.

Pellets. Yesterday Archie began saying pulk, pulk and shaking his head, (The seventh) soon disgorging a pellet of mouse-hair--the seventh known to date. **The evidence is that** these pellets represent an accumulation over over a period of several days, the intervals being irregular and mouse diet the cause.

November 11th.

The humming bird was not in his roost by the west living-room

window, although the night was clear, calm and mild.

November 12th.

Road-runners' A large mouse was given today yesterday. I killed it but its attitude toward mice and meat today. it had been offered to A and T, but although they pecked it once or twice they also abandoned it.

It was put into the cage and left there all night. In the morning it was found up on a shelf, the forward half of the body being damp and showing signs of an effort having been made to swallow it.

Later in the morning Terry "killed it again", but did not eat it. It was then placed in Rhody's dish outside the cage with his meat.

When he came to the cage at noon he took the mouse by preference, carried it off about 10 feet, dropped it to the ground and stood looking at it. He left it, came and got the meat, paying no further attention to the mouse.

Each of the youngsters was given a small mouse today, well within their capacity to swallow whole. They killed the mice after hunting for them in the growth within the cage, but lost interest in them when dead, and ate meat in preference to them, showing, presumably, that they were hungry, but that their interest in the mice was as something to capture, *at the time*.

All of these road-runners like their food alive and kicking. If very hungry, they will eat dead things, but they must be fresh. The liking for butcher's meat is an acquired taste. They have overcome, partially at least, their objection--if any--to its deadness. Yet it is still observable that a piece of meat which they have frequently ignored will be eaten when picked up and offered to them from hand.

R and young. Rhody continues to be interested in the youngsters and always displays his skin colors when looking at them. The red is very bright. He still maintains silence in their presence, the talking being done by Archie and Terry, who move about to get a better look at him, using me as a perch if I happen to be in the right place, sometimes waving their tails back and forth in a horizontal plane. This tail movement, not the usual one as has been pointed out, has some special significance. So far it appears to signify some unique interest, the exact character of which escapes me. It seems to be used only on special occasions.

Significance of sidewise tail wag.

A's early retiring. Cloudy all day. Archie went to bed at 3 P.M.--a record for him. I continued work on the cage for two hours longer, hammering, sawing, etc. He was in the new part. I was outside and the progress of the work required that I drive nails within 3 inches of his stern where it was backed up against the wall. During this two hour period he did not once leave his bed. Heretofore he might have been in and out 20 times.

A's indifference to noise of known origin.

Speculation.

I doubt if the cloudiness had much to do with his early retiring, since it caused neither Terry nor Brownie to advance their roosting time. Archie had just eaten two water-dogs (newts) and perhaps considered he had done a full day's work. A's greater composure in his roost may be attributable to the fact that, since he adopted the new roost in the addition, there has been no friction between him and T at bed-time and T is at liberty to take any of the older locations that he prefers, usually, now, the hanging nest.

A's roosting time unchanged by weather.

Brownie, as intimated, went to bed (in the dorm.) at his usual time: a little after sunset, though on account of cloudiness, there was not much to indicate time of sunset.

Humming-bird in his roost. Although it is threatening rain, the hummer is back on his roost again. Perhaps he knows best, and it will not rain tonight. He evidently has another roost someplace for inclement weather and I thought he would occupy it tonight. (Calm).

November 13th.

Hummer was right. Well, the humming-bird did know best, after all, for it cleared up early in the night and the day dawned bright and fair, remaining so.

Archie changes the color of the skin on his bald patch. When Archie lost his crown feathers I noticed particularly that the color of the skin was as white as that of a Caucasian of the fair type. I was rather surprised at the time because I had expected to find it dark.

Today, however, the very same skin is of the same color as that above his eyes, viz.: an opaque looking purplish slate. There can be no doubt whatever of the accuracy of these two observations. There is no vestige of white surrounding the new pin-feathers. As some of these feathers will become purplish black crest feathers, one wonders whether the feather color is due to pigment and if the change in skin color is due to a "rush" of pigment to this area. It should be noted, perhaps, that the sheathes of the pin feathers are slaty colored at their lower ends and white at the top.

A reverts to hanging nest, Archie went back to the hanging nest at bed-time. I fired him out and let Terry take it.

Hummer on job. The hummer was on his roost at sunset.

A and T eat the mice, The mice that A and T killed yesterday but did not eat, were eaten today by A and, or T.

R remembers old roost? Mrs. Scamell says that Rhody occasionally stands on her lawn and contemplates the tree in which he formerly roosted at night as if considering going back to it.

November 14th.

When I went to the cage in the morning Archie and Terry sat side by side amicably on the perch fastened to the inside of the entrance door as if waiting for me. It was apparent from a considerable distance that there had been some sort of a disturbance previously, as both had feathers awry in their crests and Archie had again lost some of his. Examination of the cage showed no feathers sticking to the wires, but numerous fresh head, neck and soft body feathers strewn about. I found a place on A's neck from which a tuft of feathers had evidently been plucked and Terry's forehead had again been caused to bleed, but the blood had dried and blackened. There were also several of the feathers from the "false wings" scattered about. Altogether it looked like internal dissension instead of a fright from an outside prowler. The tuft pulled from Archie's neck made it look as if he had endeavored to dispossess T at the hanging nest and T had retaliated and from that further strife had arisen, especially bearing in mind that Archie had, at bed-time, last night resumed his interest in the hanging nest and been dispossessed by me.

Still there was no evident bad feeling between them now and, as I approached their roost, both jumped to my shoulders and sat there contentedly while I stroked their plumage, one on each shoulder.

Skin on A's head.

It was again noted that the new bare spot on Archie's head was nearly white, forming a contrast with the recently acquired slaty color under the new pin feathers further toward the front. (See prev 30)

Since these birds do not see well in the dark, the trouble, if internal, probably arose about day-break, at which time, I imagine, A may have bethought himself of the hanging nest. There is, however, still some mystery about this whole situation. It may be that the birds will have to be separated at night.

Unsettled behavior at bed-time again.

5:30 P.M. At about 4 P.M. Archie took the hanging nest without considering any other place. This left Terry "up in the air" again, and for an hour, he was a pathetic little figure wandering about looking for a place to sleep. The situation, which I had thought was corrected by the new addition to the cage, relapsed completely. Terry would not try any of the old places where he used to roost in seeming perfect content. (Strange that they should now be taboo). He tried all manner of perfectly hopeless, exposed, uncomfortable and dangerous roosts while Archie craned his neck to watch his movements. All of these selections were in the outside cage, as if to get as far from A as possible (which may really have been the motive) and not once did he look at the several fine places I had put up in the new erection. I tried four or five times to take him to one of them without using compulsion without success. This, by the way is both easier and harder than appears on the surface. Easier, because by standing close to him in one of his hopeless choices, he would jump to my shoulder voluntarily and I could then walk with him to the place where I wanted him to sleep. Harder, because, having succeeded so far, each time he decided that he wanted to sleep on my shoulder and not leave it at all. Thus he would back up against my neck in approved road-runner fashion and flatten his tail against my cheek or ear, puff out his feathers, settle himself comfortably, and (figuratively) sigh with relief now that the dilemma had been solved completely. This solution, however, failed to take into consideration the human factor, and although I had not subjected him to compulsion since he was a little squab, I finally took him in both hands (he struggled a little, but did not cry out) and put him in the bunk in the new extension which Archie abandoned last night. He promptly composed himself and peace reigned. I hope he sticks. By this time it was 5 P.M. and a little too dark for him to wander accurately.

T roosts on me, using face for tail support.

I put him to bed.

He sticks.

10 P.M. Well, so far, he has stuck.

Hummer.

Hummer not on his roost by the western window. (Cloudy).

November 15th.

Hummer on roost

9:15 P.M. A slight rain falling. The hummer is at his roost, not at all protected from the rain. A few minutes ago there was a short brisk shower which did not disturb him.

Road-runner roosting.

At 4:30 P.M. I went to the cage to see how the youngsters were faring. Archie was going in and out of the hanging nest and Terry was in his now usual state of indecision. When I entered the cage Terry, without my offering any inducements, flew to my shoulder and snuggled against my neck. When I slipped a hand under his tail I lifted his feet out from under it, placed them on top and then lay down on it confidently, fluffed out his feathers, braced his tail against my head apparently quite certain that this was the place he was looking for and that there was no reason for further worry. It soon

became clear that he had no intention of leaving at all, so I tried to "walk" him into the other cage; Archie was still popping in and out of his bunk and I gathered that Terry, until assured of Archie's final decision, was reluctant to hazard a selection in his immediate vicinity, for he left me and returned to the outer cage. I then took him in my hands and repeated last night's action, but he would not "stay put". I repeated it with the same result. (Archie was still undecided; it was not too dark for the birds to see well and the quail, spotted towhees and various crowned sparrows were very noisy in the surrounding trees. This always seems to disturb the young road-runners at bed-time). Terry struggled even less in my hands than last night. I went off and left them. Returning after a half hour, both appeared to be well settled, Archie in the hanging nest and Terry in No.4.

Thrasher song. Brownie was in full voice early this morning, but reference to notes of last year of corresponding date show that there is less song now. Last year at this time B had a nest in the dorm (with an acorn in it) and sang sub-song there while in the nest, and full song early in the morning--usually.

November 16th.

Terry escapes temporarily. This afternoon when I opened the door to the cage, as soon as it was barely cracked, Terry^{was} out, on my shoulder and off before I could get my hands on him. He wanted to see the world. His travels extended but a few yards, during which he stared at everything in round-eyed wonder. He was an easy victim, as I merely went to him and picked him up. He did not try to avoid me, although he struggled a little when I had him in my hands. He is pretty strong. There was no outcry, and when back in the cage again, he was just as confident as ever, showing neither fear nor resentment as a consequence of this rude interruption of his plans.

Bed-time. At bed-time Terry again elected to occupy my shoulder as a couch for the night, but we compromised and he took No. 4 as second choice, Archie having finally decided definitely on the hanging nest.

Hummer.absent. The humming-bird is again absent from his known roost. Since he was first observed there on the 22nd. he has occupied the roost 15 times in 22 nights

November 17th. to 21st.. incl.

Hummer absent from roost. During this period the hummer was not seen to occupy his night roost at all.

Thrashers quiet. The thrashers, aside from occasional sub-song by Brownie and a few calls, were little in evidence.

RRs as usual. All three road-runners behaved true to form, Terry still being restless at bed-time, deferring his final retirement until long after Archie and continuing to experiment on me as a place to sleep.

November 22nd.

A huge tom-cat was found in the trap at the cage. A and T viewed the carcass placidly.

An Exceptional Case of "Freezing" by Terry.

At about 5 P.M. (Sunset 4.54) Terry was "frozen" on the perch

attached to the inside of the entrance door. I happened to be standing by him at the time he froze and noted that it synchronized with the first sounds heard (by me) from a group of children about 300 yards away to the south.

Terry's bill was pointed toward the south-west; he was sitting diagonally on the perch in a crouching attitude, his breast not touching the perch. The posture was strained. He was absolutely rigid, making no movement whatever when I stroked his plumage and talked to him. He might have been carved out of wood, except that his eyes were slightly mobile. He had a firm grip on the roost; even his upwardly curving rear toe was bent down and clasped around it.

Julio approached from the west (Terry not moving) and pointed out a hawk sitting immovably upon the topmost snag of the old oak about 25 yards due south. Terry could see the bird with one eye.

The hawk (sparrow) was not disturbed, but left in about 5 minutes. Terry did not show any sign of noting its departure, but remained fixed.

At 5:15 I unclasped his toes from the perch and picked him up without his making any movement other than to grip one finger strongly with one foot; the other foot was doubled up tightly in a fist and he thus rested a part of his weight upon the back of those toes. I carried him into the other cage and placed him on a shelf in the new portion. His posture was in no way altered during this process, the bend of his legs, the angle at which his neck and head were disposed as to his body, etc., all remaining the same.

He now rested on the backs of the toes of both feet and I unclasped all of these toes and spread them out into proper position, took his tail, which was hanging down, and pointed it upward vertically, placing it against the wall. He still did not move.

I sat down about 10 feet away. In six minutes his head moved slightly sidewise, then back to the original pose. I went to him, felt under and about him, finding no change from the 5 P.M. condition and no apparent awareness of my presence or activities.

I left him thus (he had not settled into a comfortable resting position). At 9 P.M. I returned. I did not risk disturbing him. He was still as placed, but I think (although it was too dark to see well) that he had relaxed and was then normal.

Considering everything, it would seem that the bird was really in a hypnotic state. (Compare somewhat similar incident with Archie of Oct. 20, in which, in the light of the foregoing, it now looks as if A had hypnotized himself by staring fixedly at the magpies).

In both cases the bird was concentrating upon a definite object and, presumably, in unstable nervous equilibrium (if there is such a thing) and was stroked gently by me (with, however, no thought of trying to hypnotize it). This combination of conditions rather surprisingly resembles the procedure of hypnotists.

This incident causes one to wonder if there may not be something after all, in the popular belief that birds are sometimes "charmed" by snakes.

November 23rd. to 28th. incl.

During this period the weather has been summer-like.

Hummer

This bird was not seen again on his night roost, but humming-birds (Annas) were common enough during the day.

Thrashers. Brownie the only one in evidence; rather quiet, although frequently singing quarter song for long stretches.

Road-runners. No change of unusual interest, although it should be noted that neither of the youngsters has buzzed about my feet for some time; this action seeming to be a juvenile characteristic.

Archie's bill. The decurved tip is now flush with the lower line of the lower mandible; but this is still short of normal as determined by comparison with Terry, Rhody and skins at M.V.Z.

"Worm-box reaction". Archie continues to respond promptly to sight of the worm-box; but Terry not at all, unless first shown a worm. A may or may not react to the "frog" sound given out by it.

Rhody and young. Rhody continues to be interested in the young birds; but the talk is still all by then.

At these meetings all three may swing their tails slowly back and forth in a horizontal plane. This posture seems to be used principally when in contact with other road-runners, though not always.

Pellets. No pellets have been found since the seventh on Nov. 11th.

Skin-color change. (See Nov. 13 and 14). Confirming the change in color of A's bald spot from "white" to slate: The bare patch exposed by the debacle of Nov. 14th. (The second bare patch) began to change to a darker hue noticeably the first day.

"Replacement of A's head feathers. This has progressed so rapidly that, unless the crest is erected, the head looks normal.

"Rumbling bowels" Sometimes when one of these little fellows is sitting close to one of my ears I can hear a "rumbling" of his "bowels", showing, I suppose, that these creatures, notwithstanding (or perhaps because of) their extraordinary digestive powers, are subject to flatulence. Occasionally, also, one or the other has been observed to discharge faecal matter composed largely of bubbles.

Excretion. These birds do not foul their roosting places and there is no accumulation of excrement below them. This applies to Rhody as well as to the youngsters.

Usually a very considerable mass of excrement is discharged by each bird, at one performance each morning sometime before 9 o'clock, or thereabouts. Thereafter, during the rest of the day, but small amounts, individually and in the aggregate, are voided and at infrequent intervals and it seems to me that none of the food eaten during the daylight hours is ever completely digested in the same calendar day, and the waste rejected. Thus the fur of a mouse eaten even in the early morning does not appear in the excrement until the next morning.

December 1st. to 10th., incl.

During this period all of the birds under observation, except the hummer at night, have been contacted every day.

Thrashers

Brownie has been very quiet and appears to be roaming about to considerable distances. One morning he was heard scripping over at the Robinsons' 250 yards away, but on being called from here, came readily enough to eat from hand. It was noted, however, that, on the journey toward home, he went from bush to bush, on the ground and kept a sharp lookout for hawks, and even while with me, kept a weather eye open.

Nothing was seen (or heard) of Nova or other thrashers.

Road-runners

All present and accounted for during this period, and normal.

Sleeping habits. The sun sets now (10th.) at 4:51. Rhody goes to bed about an hour earlier, but, as noted in the past, his time is irregular. A single observation on his rising time, found him in bed at 10:30 A.M. in his usual place, but, on seeing me upon the sidewalk 20 feet below his roost offering sustenance, deserted his quarters and came for worms.

Archie continued to occupy the hanging nest exclusively at night. Terry, for more than a week, now, has been less restless at bedtime, though still inclined to occupy my shoulder. He seems to have adopted pretty definitely the shelf in the new portion of the cage, first discovered and used (but abandoned) by Archie.

Both birds (because of the artificial conditions under which they are living?) go to bed later than Rhody and get up earlier.

Freezing.

These two are the most frequent "freezers" I have seen, and remain rigid for longer periods. They freeze when a hawk perches on the old oak, but not when they see one flying high overhead. In the latter case, they watch the hawk for a time, but may turn away, as if satisfied that it is harmless, even when the bird is still in sight. Usually they watch with one eye only.

On the 9th. Archie, sitting on my shoulder, suddenly froze, remaining in that condition for perhaps ten minutes, when Julio appeared announcing that there was a hawk, unseen from where I stood, sitting on the old oak. A had apparently seen it fly to the tree and not reappear. He thawed as soon as it flew.

On the 10th., as I approached the cage, Archie was seen to be frozen again. I could see nothing to disturb him. I entered the cage and picked him off the top of the rock where he sat. He did not appear to notice my approach and the only movements he made for about 20 minutes when I held him in my hands were:

Twice, a slight shifting of a foot to a more comfortable position.

Winking, and expanding and contracting his pupils.

A slight neck movement made in order to maintain his head fixed at a definite point in space as I purposely moved his body about in a small circle.

A settling of his body to take the weight off of his feet and transfer it to my hands.

At the end of this period (time estimated) he began to look about cautiously, but never once at me. I think he knew where he was all of the time. There was no sudden "coming to" and no apparent alarm; he perhaps felt too warm in my hands and shifted to my knee, sitting there quietly until he became interested in Terry's activities and went to investigate.

It is interesting to note here that Terry was only about six feet away during all of this time, sitting on the porch of the house. (The one originally made for Rhody and placed in the Scamell tree where he roosted, and now hanging in the outer cage). Terry was normal while this was going on, yet, due to his location, must have been able to see everything that Archie did, and, as has been repeatedly observed, Terry is the more sensitive to outside affairs.

It looks as if Archie had hypnotised himself.

This freezing habit and more particularly, the non-resistance of the bird when in this state to approach and handling, lends "an air of verisimilitude" to the popular snake-charming stories; but allowance has to be made for the fact that, thus far, these birds have been subjected to such treatment only by a recognised friend- not by an enemy--and that they have for some time been growing more tolerant of handling by me when in full possession of all of their faculties.

December 11th.

This increasing tolerance above noted has been evidenced by their allowing me to pick them up occasionally without becoming frightened and stroke their plumage. (They allowed this, and, in fact, invited it when very young, but on becoming more sophisticated with increasing age, resented it or shrank from it).

It has been thought (see back notes) that friction between the young road-runners at bed-time might be a manifestation of the intolerance of adult road runners toward each other, since they are thought to be solitary birds except in the mating season.

Somewhat of a set-back was given to this theory when, at 8:30 A.M., both youngsters were found snugly ensconced together in the "house" above mentioned, which is really too small for one. This was a performance unheard of since they were mere squabs. They were calm and unruffled, at peace with the world, Terry behind and partly on top of Archie--not the slightest evidence of antagonism or fear. A half hour later they were sitting side by side on the porch of this house. (Temp. at 8:30, 51 deg.)

At 10:20 they were still sitting there, but Terry got down. Archie shrank a little at first as I enclosed him in both hands and considered going elsewhere, but did not.

December 12th. to 15th., incl. (Notes written on 15th.).

B's sub-song.

No change during this period. A large part of Brownie's time was spent under the bushes on the warm south bank singing sub-song. No other thrashers seen or heard.

A Hawk-Road-runner Incident.

On the fifteenth, as I was sitting inside the road-runner cage with Archie sunning himself on the ground at my feet and Terry sitting 12 feet away upon a shelf screened from the outside by glass windows, a hawk was seen to drop down from the branches of an oak about 20 yards to the S.E., hover a moment above a clump of bushes and then disappear amongst the trees. Rhody, who had been getting meat outside the cage, had just retired into this same clump, was presumably still there, and the object of the hawk's interest. Since the hawk (either a Cooper or a Sharp-shin) had left I knew Rhody was safe for the time being, so turned my attention to Archie, who had frozen instantly and without preliminaries, although he could have seen the hawk for not more than 3 or 4 seconds. Archie was as stiff as a poker and could not even straighten out his toes when I picked him up and put him on a shelf. unclasped his fists one toe at a time and set him on his feet. His head, which had been turned toward the hawk, was now in nearly the opposite direction, but still making the same angle with his body. That is: He had not moved it at all while in my

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hands, so that reflex, or whatever it is, that constrains a bird to attempt to hold its head fixed in space when its body is moved, was clearly not working and he had also "forgotten" to re-direct his attention toward the point of danger. A glance in Terry's direction showed him frozen in the corner with his tail bent in a horizontal plane at right angles to his body. The time of Archie's solidification was 1:20 P.M.

I naturally wished to see how Rhody reacted to all this, but considered it the part of wisdom first to prepare myself adequately to enforce my own ideas as to the measures which should be taken in preserving Nature's balance within my property lines. As a consequence some 3 or 4 minutes elapsed before I reached Rhody's supposed location with a gun, keeping a sharp lookout for the raider. Rhody was not more than 3 or 4 feet from where I thought he should be, but although the brush was not dense, it was perhaps a minute before I saw him, so perfectly did his plumage blend with the sage, baccharis, broom and mimulus forming his retreat. While he was lying quietly upon the ground, he was moving his head about cautiously and was not frozen. He did not look at me at all. A search for the hawk proved fruitless. At 1:35 both youngsters were still frozen in unchanged attitudes, but Terry seemed somewhat more "limber". Neither would accept a proffered meal-worm, though Terry rolled his eyes at it without moving his head.

After 20 minutes had elapsed from the appearance of the hawk, Terry would reach out and touch the worm gently with his bill and follow the movements of my hand as I withdrew it, with his eyes, and Archie would eat those offered him. Rhody, who had moved to a more comfortable location, about 5 feet from his original one, and was now lying upon a flat spray of foliage overhanging the bank of the road, would reach eagerly for all offerings, but not shift position to do so. At about 1:45 Terry accepted worms, but he was still in the same awkward posture. Both young birds gradually relaxed and settled more comfortably upon their shelves, but it was a full hour before either altered sensibly the pose of his head and body or shifted his feet, and it was 2:30 before Terry got up and stretched, followed almost immediately by Archie's standing up and looking about. Both birds now became quickly normal to all appearances and moved about unconfinedly.

Rhody left about this time and wandered off slowly. When I thought he was about due at his night roost, I went there. In a few minutes he was seen climbing out upon the branch of the adjoining tree which he uses as a highway and at 3:16 jumped across the gap and settled in his night roost. The sun was shining brightly in a cloudless sky with sunset more than an hour and a half away. But that is Rhody. His two children were an hour to an hour and a half later in retreating to their bunks for good.

December 16th. to 24th., incl. (Notes written on Dec. 24).

Terry's new adult gesture. About the only new happening in this period was Terry's unexpected use of a gesture hitherto observed only in the case of Rhody and then only during the mating season.

Terry, in greeting me one morning (21st.) with his usual lowered head and plaintive whine, suddenly jumped down from his perch, cocked his tail up perpendicularly and clapped his wings three times in rapid succession above his back. A half hour or so later he did it again. He is growing up! Here is one event in which he has anticipated Archie.

Archie's bill. The decurved tip of the upper mandible now projects perceptibly below the lower, but not so much as Terry's. (The tip was broken off on Aug. 18).

W moult.

This may be considered completed. Making no allowance for known accidental loss of feathers, the feathers known to have been renewed in the natural course are:

All "soft" feathers on head, neck and body, including wing and tail coverts, eyelashes and bristles. It is not positively known that all of these were moulted, since the process is long and gradual and many feathers are replaced entirely before their fellows in the same tract have fallen; thus during the moult the plumage is made up of old and new feathers, pin feathers and bare places.

The two middle rectrices are believed to have been moulted naturally on both birds; many of the others were lost through accident, but both birds still have many of their original tail feathers; Terry even having two of the stubs of the feathers which I cut off.

The alulae were shed wholly or in part; I am inclined to think by accident.

A few flight feathers were lost; all, I think, by accident.

The natural moult, then, appeared to consist of the soft feathers plus two middle rectrices, though it seems odd that these tail feathers should be exceptions.

Night roosting.

A and T seem to have pretty definitely settled the matter of their resting places for the night. There has been no disturbance at bed-time for many days: each bird goes to his selected place without interference with the other. Archie still uses the hanging nest exclusively and T the small shelf in the new extension. They may, and usually do, pop in and out a number of times before settling for the night, as if to observe what is going on, this being directly contrary to Rhody's habit of remaining in his roost after once going there.

Relations between A and T.

No tendency of Archie to domineer over Terry has been observed for two or three weeks, and they seem to be more tolerant of each other than they were before.

Reactions to worm box.

Archie usually reacts at once when shown the worm box, but Terry not at all, though he seems to like worms as well as A.

8th. pellet.

The 8th. pellet, a felted mass of mouse hair was found on the 21st.

Eye-shine.

This has never been observed when a light is turned upon the birds at night; but during this period it was seen once in Archie just as he emerged from shadow into the direct sun light.

Rhody annoyed by boys.

On the 19th. Dr. Scamell came over to tell me that three boys were shooting at birds in the lot to the west of here with sling shots. This is Rhody's domain. We went there, meeting Rhody who appeared to have been driven out by the boys, but the boys were not to be found. The intention was to call the police.

Rhody absent.

Rhody appeared here as usual on the 20th. and 21st., but was not in his night roost on the 22nd., 23rd. and 24th., nor was he seen by me on any of the three days. His meat outside the cage was not taken on the 24th. On the other two days it is possible, of course, that, although it disappeared, it may have been taken by some other creature. During this three day period search in his accustomed haunts and calling produced no results.

December 25th. 12:50 P.M. no Rhody to be found. I wonder where he will get his Christmas dinner. He was to have had mice, meat,

meal worms and anything else suiting his fancy, although he is neither a gourmand nor, from our view-point, a gourmet.

At 1:30 his meat was gone, so presumably he is here. I had to leave for the rest of the day.

December 26th.

Well, Rhody is back again doing his usual things. When he sailed off to investigate a tree full of birds about a hundred yards to the south, I followed. After making some fancy evolutions he came to me for worms, then strolled about the empty field, finally heading back here where he disappeared absolutely practically under my nose.

An hour or so after his regular roosting time he was not in his regular roost. Perhaps he has moved to another place.

December 27th.

Rain during the night. Badly needed, since we have had less than 3 inches since July 1st. and a large part of that of no value since it came, freakishly, in August.

At 9 A.M. both Rhody and Brownie were in the orchard, B dry and R wet only as to tail. Sunny and mild after the rain.

When B came to me for worms he was full of soft talk, which, from previous experience, I have learned may not be for me, but for another thrasher. During the last few weeks Brownie has been about the only thrasher seen or heard here, but on this occasion I could hear another one scripping off to the south east. B climbed to a branch about 3 feet over my head in a peach tree and called in old time form. In a few minutes another thrasher appeared about 10 yards away, saw me, and retreated into the bushes. B did nothing about it at the time, but about an hour later, when I looked him up again, a thrasher sneaked into the bushes again from his immediate vicinity. The bird may have been Nova and B may have known all about her movements since the last nest was built. Certainly he showed no especial excitement. I expect increasing full song from now on.

Rhody allowed me to walk right up to him and hand him worms. A live mouse given him was incapacitated without being beaten upon the ground at all; a squeeze or two in the bill being enough, although the creature was still kicking as it disappeared down the bird's gullet. Although Rhody's children are occasionally able to dispose of a small mouse in this summary fashion, it is quite apparent that the parent is still more powerful than his offspring.

Long after his usual bed time Rhody was not in his regular roost.

December 28th.

Rhody about as usual, but not in his regular roost at night.

December 29th.

Heavy rain during the night, but sunny in the morning.

At 9 A.M. Brownie was dry. After coming for worms, he called, getting an almost instant response from, undoubtedly, Nova, since it was a short singing reply in her unique, high-pitched voice.

At the same time Rhody, with slightly wet tail, was sunning his back in the orchard. He hung around until about 2:35 P.M.,

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then began to stroll westward along the route he used when sleeping in the Scamells' oak. This afforded an opportunity of solving the mystery of his present sleeping place; accordingly I followed. When he passed through the side gate he stopped to dust at the very same spot that he has used regularly on previous occasions, then proceeded slowly with frequent stops, along the sidewalk and across the street to Scamells' making only a foot to three feet at each advance. He went to the base of the old oak where he used to roost, plainly considered going up into it, but finally passed through the railing and went south along the fence at the same snail's pace with frequent stops to sun himself and "rest". He appeared to be headed for the same Canary Island pine in the Scamells' back garden where he roosted a few times months ago, and so it proved. He was met at the fence by the dog Bonzo, who, curiously enough, did not appear to see him as he was watching me, in expectation of a frolic with the rubber bone he was carrying. Rhody jumped to the top of the fence, directly towards the dog and not more than 6 feet from him. He did not appear to be especially wary. At 3:17 exactly he jumped up into the tree--just a half minute later than on the last occasion recorded--and disposed himself for the night. As the distance covered in roughly three quarters of an hour was about 150 yards, some idea may be had of the deliberateness of the whole performance. For perhaps half of the time and the distance the bird was right out in the open. (Clear, temp. at 4:10: 54 deg., sunset at 4:59).

December 30th.

A chill, drizzling rain all day.
Rhody, when seen, looking wet, miserable and disgusted with the world. He took his new roost in the pine tree.

The youngsters considered the rain a novelty at first and spread their wings and tails to catch it, looking interested and bright. After an hour or so it palled on them and they became sluggish and dull, but still did not take proper protection from it, so I shut them up in the dry, glass-roofed portion. (9 feet sq.)

December 31st.

The sun rose in a clear sky and at this elevation the whole day was mild and fair. At lower elevations, however, there were banks of fog.

Brownie opened the day with song over at Robinson's, but when I called him, returned at once, running and flying.

Rhody was still at his roost in the Scamells' pine at 9:15A.M. and refused to come down for worms or meat. He was still there at 10 to 10:15, ditto 11:10 to 11:25. I did not call on him again but at about 1:30 he was at the cage for food and for a good stare at the youngsters, who seemed more than usually interested in him, moving about to keep in touch with him, flattening their bellies upon the ground facing him and making wahks and goose-like sounds. Curious how the tactics have reversed.

